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Market Valuation Perspectives for Photovoltaic Systems

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Abstract

Sandia National Laboratories, working with Energy Sense Finance developed the proof-of-concept PV Value® tool in 2011 to provide real estate appraisers a tool that can be used to develop the market value and fair market value of a solar photovoltaic system. PV Value® moved from a proof-of-concept spreadsheet to a commercial web-based tool developed and operated exclusively by Energy Sense Finance in June 2014. This paper presents the results of a survey aimed at different user categories in order to measure how the tool is being used in the marketplace as well as elicit information that can be used to improve the tool's effectiveness.

ACKNOWLEDGEMENTS

The author would like to acknowledge the survey participants for taking the time to use the PV Value® tool and share their experiences. Special thanks go to Bill Godden of the Appraisal Institute for providing suggestions and helping review the questions utilized in each survey. Thanks also goes to Jamie Johnson with Energy Sense Finance, and Sandra Adomatis with Adomatis Appraisal Services for their suggestions on questions, and providing peer review and comments, as well as Ben Hoen at Lawrence Berkeley National Laboratory for his peer review and comments. This work was funded by the U.S. Department of Energy's SunShot Initiative.

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EXECUTIVE SUMMARY

Sandia National Laboratories conducted a survey of existing users of the PV Value® proof-of-concept spreadsheet (http://pv.sandia.gov/pvvalue) to measure their perceptions and usage of the tool for developing the value of a photovoltaic power system as part of a real estate transaction. Real estate appraisers are just beginning to encounter photovoltaic (PV) systems (both owned and leased) in their property assessments, and due to the limited market penetration of PV systems across the U.S., they are just now learning how to apply standard valuation techniques that recognize the electricity generating properties of a PV system. The role of the appraiser is important, as they measure and convey market support to those that both originate and underwrite loans where the value of a PV system may be included. As the market value of PV systems are being recognized, other stakeholders are taking notice, including homeowners, real estate agents and the solar PV industry.

The survey was sent to 2432 unique users who have downloaded and used the PV Value® tool between December 2011 and February 2014. Responses from 320 users were recorded in the survey and included residential appraisers, commercial appraisers, real estate agents, lenders & loan officers, underwriters, government users, solar industry professionals and homeowners.

Important observations about the tool and its use for developing the value of a PV system include the following:

- When it was known by the appraiser if the underwriter accepted or rejected the valuation of the PV system, 90% of residential appraisers (n=83) stated that the valuation of the PV system was accepted.
- Using PV Value®, residential (n=88) and commercial appraisers (n=46) generally used the estimate from the tool and did not adjust the value either upward or downward, at 49% and 44%, respectively.
- According to homeowners (n=65), the PV Value® tool was used to develop a "market analysis" for the value of the PV system before listing home for sale (37%).
- When developing a discount rate, commercial appraisers have many different sources for their risk-free rate (n=29), and reported basis point spreads (n=31) that span an approximate *difference* between 100 and 200 (1.0% and 2.0%) on top of the risk free rate.
- A majority of survey participants believe an owned solar PV system adds to the value of real property in a real estate transaction, though when asked about third-party owned PV systems (lease or PPA), their responses reflected greater uncertainty as most were "not sure."

These results suggest that appraisers are successful at getting the PV system included in the property value when using PV Value®. Efforts to improve the tool are underway, and many of the improvements suggested by the respondents are being implemented and planned as future improvements to the tool. There are still areas of uncertainty, especially in stakeholder perceptions of value based on ownership of the PV system, which impacts residential properties with federal underwriting and insurance products. This will remain a source of uncertainty until agencies such as HUD (FHA), and the FHFA (Fannie Mae, Freddie Mac) develop guidelines on ways to analyze these different ownership options in a real property appraisal.

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ACRONYMS AND ABBREVIATIONS

AI	Appraisal Institute
bps	basis point spread
DCF	discounted cash flow
DC	direct current
FMV	Fair Market Value
FHA	Federal Housing Administration
FHFA	Federal Housing Finance Agency
HUD	U.S. Department of Housing and Urban Development
IREC	Interstate Renewable Energy Council
IRS	Internal Revenue Service
kWh	kilowatt-hour
LBNL	Lawrence Berkeley National Laboratory
MLS	Multiple Listing Service
PACE	Property Assessed Clean Energy
PBI	Performance Based Incentive
PPA	Power Purchase Agreement
PV	photovoltaic
REC	Renewable Energy Credit
SREC	Solar Renewable Energy Credit
SNL	Sandia National Laboratories
TPO	third-party owned
VA	U.S. Department of Veterans Affairs

1. INTRODUCTION

Solar Photovoltaic (PV) systems are being installed at a record pace; at the time of this publication over 13GW DC of PV is operating in the U.S., which represents 482,000 individual systems (SEIA, 2014). These PV systems will eventually need to be valued at different stages of their lifetime due to real or personal property transfers, which in a large part will depend on the PV ownership structure (Klise and Johnson, 2014). It has been documented in California that owned PV systems do add a premium compared to properties without owned PV systems (Hoen et al., 2011; 2013), though it is unclear as to what methods are used by the appraiser to develop the value, along with the influence other parties in a real estate transaction may have on that value, including the home seller, home buyer, real estate agent, lender, loan officer and underwriter.

As properties change ownership, appraisers are hired to develop the market value of the property and any real or personal property that may or may not be included in that transfer. PV systems are still relatively "new" in most market areas; therefore appraisal professionals will require education and tools to understand a PV system's unique value proposition as an energy generating technology. A PV system is not a common item that is found on most residential and commercial properties across the U.S., but is becoming more common in areas where market adoption is strong and continuing to increase (SEIA, 2014).

Sandia National Laboratories partnered with Energy Sense Finance in 2011 to help commercialize the PV Value® tool, which is used to develop the market value of a solar PV system. Through tool development, outreach and education, it was presented to the appraisal industry as a proof-of-concept[1] to measure its effectiveness at removing the valuation market barrier recognized over eight years ago for owned PV systems (Margolis, 2006). Outreach and education is currently being offered through a variety of channels, including the following: development of continuing education course materials with the Appraisal Institute, webinars hosed by Sandia Labs, Interstate Renewable Energy Council (IREC) and the Appraisal Institute, a white paper (Klise and Johnson, 2014), journal publication (Klise et al., 2013), industry workshops and conferences, and a strategic partnership with Lawrence Berkeley National Laboratory (LBNL) to study residential PV premiums (Hoen et al., 2011; 2013).

The success of the proof-of-concept led Energy Sense Finance to create a web-based version at www.pvvalue.com that will be more accessible to users, and have expanded capabilities beyond the spreadsheet version. During this transition, a survey was sent out to over 2432 unique registered users of the tool to measure their perception of effectiveness based on what stakeholders they interact with when using the tool as well as perceptions of value from their role in either facilitating or benefitting from the transaction. Three hundred and twenty (320) users participated from the following self-identified user classes:

1) Residential Appraisers, 2) Commercial Appraisers, 3) Real Estate Agents, 4) Lenders & Loan Officers, 5) Underwriters, 6) Government Users, 7) Solar Industry Professionals, and 8) Homeowners.

[1] http://pv.sandia.gov/pvvalue

2. METHODS

2.1. Rationale for Survey

The intent of this survey was to qualitatively measure user satisfaction and perceptions to value from eight self-identified user groups in order to help prioritize improvements to the tool and help guide future research efforts. This survey is also important as it reveals how PV Value® is being used in the marketplace since it is not possible to extract appraisal or underwriting documents from appraisers, homeowners, real estate agents, loan officers or underwriters due to privacy laws. These results will also be used to help inform and refine educational efforts and convey to stakeholders the important role that appraisers and other real estate professionals have in facilitating the adoption of solar PV systems.

The PV Value® spreadsheet tool has been available since 2011 to the general public at http://pv.sandia.gov/pvvalue. The tool has been downloaded around 5,000 times from users all across the U.S. at the time of this publication. As the tool was targeted first to both residential and commercial appraisers, the questions were designed to measure how successful appraisers have been at developing value as well as getting value accepted in the underwriting process. Since appraisers represent the largest fraction of users, approximately 50% of total downloads; their suggestions for improvement will help ensure that PV Value® web remains relevant through changes in both market dynamics and PV technologies.

Other users, including real estate agents, homeowners, solar industry, government, lenders & loan officers, and underwriters, were also included as measuring their experience is important when understanding the market value perception of a PV system. Their roles include listing and marketing a property with PV, and evaluating risk to determine what percent of the entire property's market value may be recoverable in a foreclosure. Their experience with PV Value® can shed some light on both how properties are marketed and sold, as well as how risk is perceived and mitigated. Table 1 below shows the participation rate for each user class in the survey, with 2432 invitations sent to unique users of the PV Value® tool. When the survey was released in February 2014, there were approximately 3500 downloads, though many were from the same person or included incomplete e-mail addresses. Cleaning up the list resulted in the 2432 users that received the survey, with 320 participating over a 2-month time period.

User Class	**Participation**	**Participation Rate**
Residential Appraisers	89 out of 704	12%
Commercial Appraisers	49 out of 264	18%
Real Estate Agents	10 out of 77	13%
Lenders & Loan Officers	6 out of 68	9%
Underwriters	1 out of 18	5%
Government Users	18 out of 112	16%
Solar Industry	80 out of 705	11%
Homeowners	67 out of 484	14%
Total	*320 out of 2432*	*13%*

Table 1. User Participation

Results from each user class and question as collected by the survey program are presented in Appendix A.

The remainder of this report is organized as follows:

i) Question Development
ii) General Observation from Survey Results
iii) Cross-Cutting Questions and Results
iv) Individual Question Results
v) Conclusions

2.2. Development of Questions

2.2.1 Residential Appraisers

This group received twenty-eight questions, the largest of all user classes. Table 2 shows the questions and how they are grouped by eight "Question Types," some of which also cross-cut other users classes. Much of the question content reflects the temporal nature of getting the assignment, learning about photovoltaics (if they have not done so before the assignment), collecting the data and completing the appraisal, and any feedback from the bank or underwriter. One of the key responses of interest had to do with the underwriting process, and whether PV systems appraised using PV Value® were accepted in the appraisal. Also, questions that measure the role of comparables in the appraiser's analysis are important, as their market analysis area may or may not have enough comparables to use a sales comparison approach to develop the market value. Ownership structures, whether customer owned or third-party owned will impact how the appraiser approaches valuation of the PV system (Klise and Johnson, 2014), as real property and personal property are treated differently in real estate transactions.

Question	Question Type
1) In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Markets where homes with PV are being bought and sold
2) How many times have you used the Photovoltaic (PV) Value® tool for a job assignment in the past year?	Frequency of use
3) Did you make adjustments upward or downward from the range of values provided by the tool?	Market influence on value
4) In addition to using PV Value®, did you use the cost approach or sales comparison approach when developing a value conclusion?	How comparables are viewed & use of other approaches
5) In your market, do you believe there are enough comparable properties with existing PV systems to use a comparable sales approach?	
6) When you find comparable properties with PV, how do you use paired sales to develop the value?	
7) If using paired sales, where did you find the information about comparable PV systems, in terms of size, age, condition, etc.?	
8) Did the loan underwriter accept the valuation when submitting an assignment where the PV system was valued using PV Value®?	Interface with underwriting
9) If the valuation was not accepted, what reason(s) did the underwriter give?	
10) How recently have you taken a course on appraising solar PV systems?	Education of appraiser
11) How likely would you be to take an online course in valuing PV systems if the course met state certification CE requirements?	
12) How frequently does the MLS in your area provide details about the presence of PV systems?	Data capturing and entry
13) How easy was it to obtain PV system information from the homeowners?	
14) How likely are you to continue to use the PV Value® tool when it moves to a web-	

based platform?	
15) To what extent do you enter PV system characteristics on Al Form 820.04 - Residential Green and Energy Efficient Addendum?	
16) If you do not always, or never, enter PV system characteristics on Al Form 820.04 - Residential Green Energy Efficient Addendum, please explain why not.	
17) When you appraise properties with PV systems, how frequently are PV systems shaded, or structures present that could shade the systems at various times during the day?	
18) If PV system information was not available, were you still able to make an estimate using PV Value®?	
19) How frequently have you encountered third-party owned (leased or Power Purchase Agreement) PV systems when appraising a property?	PV system ownership impacts to value – A function of whether PV system is considered real or personal property
20) If you have encountered third-party owned (leased or Power Purchase Agreement) PV systems, did you assign a value to the system?	
21) If "Yes," what methods did you use to assign a value to the PV system?	
22) Would you consider a third-party owned (leased or Power Purchase Agreement) PV system in a comparable property analysis?	
23) Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	
24) Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	
25) How frequently have you used PV Value® to develop the value of renewable energy credits (RECs or SRECs) or production based incentives (PBIs)?	Valuing renewable energy credits
26) How frequently do you consider functional obsolescence when valuing a home with a PV system?	Functional obsolescence
27) How beneficial would access to appraised values of PV systems in your market area be to your practice?	PV Value® web analysis products
28) What would make the PV Value® tool more useful?	Improvement requests

Table 2. Residential Appraiser Questions

2.2.2 Commercial Appraisers

There were sixteen questions posed to this group of appraisers who use the tool to develop value for larger PV systems. The income-based approach used by PV Value® is similar to how commercial appraisers capitalize income streams, such as rent paid by a tenant. One of the more challenging tasks for appraisers is to develop the proper discount rate, which impacts the value of the energy produced over the PV system's lifetime. That rate needs to reflect the type of property being appraised, the longevity of the building and the equipment, anticipated risk, and an understanding of the local market. In this survey, of interest is the source of the risk-free rate developed by the appraiser, as well as the risk-spread above that rate. As the PV Value® tool proof-of-concept provides a 50 to 200 bps default risk spread, we wanted a clearer picture on how appraisers are currently assessing PV system benefits and risks.

Question	Question Type
1) In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Markets where homes with PV are being bought and sold
2) How many times have you used the Photovoltaic (PV) Value® tool for a job assignment in the past year?	Frequency of use
3) Did you make adjustments upward or downward from the range of values provided by the tool?	Market influence on value
4) How easy was it to obtain PV system information from the property owner?	Data capturing and entry
5) If information was not available, were you still able to make an estimate using PV Value®?	
6) How likely are you to continue to use the PV Value® tool when it moves to a web-	

based platform?	
7) In addition to using PV Value®, did you use the cost approach or sales comparison approach when developing a value conclusion?	How comparables are viewed & use of other approaches
8) How recently have you taken a course on appraising solar PV systems?	Education of appraiser
9) How likely would you be to take an online course in valuing PV systems if the course met state certification CE requirements?	
10) What basis point spread are you using (or would you use) to handle risk?	Development of discount rate
11) What is the source of your "risk free" rate?	
12) Have you used any other tools for valuing a PV system?	Use of other DCF models
13) If you have used a different tool for valuing a PV system, what was its name?	
14) How frequently have you used PV Value® to develop the value of renewable energy credits (RECs or SRECs) or production based incentives (PBIs)?	Valuing renewable energy credits
15) How beneficial would access to appraised values of PV systems in your market area be to your practice?	PV Value® web analysis products
16) What would make the PV Value® tool more useful?	Improvement requests

Table 3. Commercial Appraiser Questions

2.2.3 Real Estate Agents

Real estate agents were asked sixteen questions that measured their view on PV systems in their marketplace. Of interest is an understanding of how data is captured and conveyed when listing a property with a PV system. This includes their thoughts on how ownership impacts value, and whether homes with PV sell quicker than homes without PV systems.

Question	Question Type
In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Markets where homes with PV are being bought and sold
Please explain your overall interest in the Photovoltaic (PV) Value® tool	General feedback
Have you listed any homes with solar PV systems in the last 5 years?	Knowledge of PV systems
If "Yes," how many homes with solar PV have you listed in the last 5 years?	
Did the home with solar PV sell more quickly than a home without solar PV?	Sales velocity
Have you suggested the PV Value® tool to homeowners if they were not previously aware of it?	Develop listing price
Have you used the PV Value® tool to develop a value as part of a "market analysis" for a homeowner?	
Does the local MLS in your area provide data entry fields for PV systems?	Use of Multiple Listing Service (MLS)
When listing the property, what MLS fields did you use to enter the PV system details?	
Are you aware of Al Form 820.04 - Residential Green and Energy Efficient Addendum?	
If "Yes," was this form helpful when capturing the property details for a PV system?	
Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	PV system ownership impacts to value – A function of whether PV system is considered real or personal property
Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	
How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	User interest and satisfaction
How beneficial would access to appraised values of PV systems in your market area be to your practice?	PV Value® web analysis products
If you have used the PV Value® tool, what would make it more useful?	Improvement requests

Table 4. Real Estate Agent Questions

2.2.4 Lenders and Loan Officers

Eleven questions were posed to the lenders & loan officers' group. Specifically of interest was confirmation on how they perceive risk when a PV system is included in the property value. Questions were also posed on whether they believe there are restrictions from government-sponsored enterprises, such as Fannie Mae, Freddie Mac, as well as FHA (HUD) and the VA.

Question	Question Type
In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Markets where homes with PV are being bought and sold
Please explain your overall interest in the Photovoltaic (PV) Value® tool	General feedback
Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	PV system ownership impacts to value – A function of whether PV system is considered real or personal property
Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	
What challenges do you encounter that make it difficult to understand the value added by a PV system?	Knowledge of PV systems
Do you believe PV systems add risk to the loan when included in the value of the property?	Understanding of risk
If "Yes," describe the risk added and how that may be remediated.	
Are you aware of any Fannie Mae, Freddie Mac, HUD, VA restrictions on recognizing the value of a PV system?	Interactions with federal underwriters
If "Yes," what specifically are those restrictions you've encountered?	
How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	User interest and satisfaction
If you have used the PV Value® tool, what would make it more useful?	Improvement requests

Table 5. Lender and Loan Officer Questions

2.2.5 Underwriters

Fifteen questions were posed to underwriters to understand their perceptions of value and review of appraisals where PV system value was included.

Question	Information Gathered
In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Markets where homes with PV are being bought and sold
Please explain your overall interest in the Photovoltaic (PV) Value® tool	General feedback
Have you used the PV Value® tool to check or validate an appraiser's valuation of a solar PV system?	Appraisal review
Did you review the PV entry fields in AI Form 820.04 – Residential Green and Energy Efficient Addendum, in conjunction with the valuation?	
What are the most important factors pertaining to the PV system that should always be included in the appraisal?	
If you have reviewed an appraisal with a solar PV system, did you accept the appraiser's opinion of value?	
If "Yes," did the appraiser use PV Value® exclusively, or a combination of other valuation approaches?	
If "No" to Q5, was this due to Fannie Mae guidelines, Freddie Mac guidelines, HUD, VA or other?	
If "No" to Q5, please provide more detail on what the appraiser did when you sent it back to them.	
Have you encountered a valuation made by an appraiser for a third-party owned PV	

system?	
If "Yes," did you accept, reject, or adjust the valuation?	
Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	PV system ownership impacts on value – A function of whether PV system is considered real or personal property
Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	
How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	User interest and satisfaction
What would make the PV Value tool more useful?	Improvement requests

Table 6. Underwriter Questions

2.2.6 Government Users

Twelve questions were posed to government users, which include assessors and others that are interested in the tool from a research perspective. Some assessors utilize the tool to determine property value impacts, whether or not the specific municipality levies a tax based on the contribution of the PV system to the real property.

Question	Question Type
In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Markets where homes with PV are being bought and sold
Please explain your overall interest in the Photovoltaic (PV) Value® tool	General feedback
Have you used the PV Value® tool for appraisal or assessment purposes?	How PV Value® is being used
If "Other," please explain how you have used PV Value®	
If your municipality exempts PV systems from assessments, do you still track the added value?	
Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	PV system ownership impacts to value – A function of whether PV system is considered real or personal property
Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	
If you are an assessor, do you use PV Value® (income approach), cost approach, sales comparison, or a combination of the three?	How comparables are viewed & use of other approaches
If you are an assessor, do you find the value determined using PV Value® to be greater or less than using the cost approach?	
How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	User interest and satisfaction
How beneficial would access to appraised values of PV systems be for your work?	PV Value® web analysis products
What would make the PV Value® tool more useful?	Improvement requests

Table 7. Government User Questions

2.2.7 Solar Industry

Twelve questions were posed to the solar industry, which consisted primarily of solar sales and installers for both owned and third-party owned PV systems. This class of users is utilizing the PV Value® tool to help sell a solar PV system for both customer and third-party owned options. Of interest are their perceptions of value as a selling point, and what role quality may have on the PV system value.

Question	Question Type
In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Markets where homes with PV are being bought and sold
Please explain your overall interest in the Photovoltaic (PV) Value® tool	General feedback
Are you a third-party solar PV provider?	User type
Have you used PV Value® to help sell a PV system, or sell a lease / PPA for a PV system?	PV Value® in the sales process
If you have used the PV Value® tool to sell a PV system or a lease/PPA, what impact did the value have on closing the sale?	
Generally, do owned PV systems add to or reduce the value of property in real estate transactions?	PV system ownership impacts to value – A function of whether PV system is considered real or personal property
Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	
If you are a third-party solar PV provider, has this tool been used by an independent appraiser to evaluate the potential fair market value of a PV system undergoing an ownership transfer?	Ownership transfer from personal to real property
Do you believe quality impacts the "market value" or "fair market value" of a PV system?	Quality impacts on value
How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	User interest and satisfaction
How beneficial would access to appraised values of PV systems be for your work?	PV Value® web analysis products
What would make the PV Value® tool more useful?	Improvement requests

Table 8. Solar Industry Questions

2.2.8 Homeowners

Sixteen questions were posed to homeowners, which looked to assess their PV adoption status and the type of PV system ownership option (owned or third-party owned). There were specific questions posed for assessing whether homeowners in third-party agreements plan to exercise early buyout options, if available. Of interest is whether the homeowner was successful at getting the appraiser to use the tool and what value they received for the PV system during the appraisal.

Question	Question Type
In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Markets where homes with PV are being bought and sold
Please explain your overall interest in the Photovoltaic (PV) Value® tool	General feedback
Do you currently own a solar PV system?	Adoption of solar PV
If "Yes," is it an owned PV system or a leased PV system?	
If "No," are you planning on leasing or purchasing a PV system in the future?	
If you own a PV system, did you pay cash or finance the PV system (independent lender, cash-out refinance, PACE assessment)?	Ownership option & structure
If you have leased your PV system, do you have a monthly lease, pre-paid lease, or Power Purchase Agreement (PPA)?	
If you own your PV system, do you believe your PV system adds value to your home?	Value perception of ownership option
If you have leased your PV system, do you believe your PV system adds value to your home?	
If your leased PV system has an early buyout clause, do you plan to use it?	Exercise buyout of lease or PPA
If you plan to, or have already exercised an early buyout option, do you believe the PV system adds more value during the lease period or after it is purchased?	

After hearing about the PV Value® tool, did you give it to a real estate agent to develop a 'market analysis' before listing your home for sale?	Data capturing and entry
After hearing about the PV Value® tool, did you give it to an appraiser when they were appraising your home?	
If PV Value was used to value the PV system on your home, what was the size of your system in kilowatts, and what was the value of the PV system?	Size and value comparisons
How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	User interest and satisfaction
What would make the PV Value tool more useful?	Improvement requests

Table 9. Homeowner Questions

3. ANALYSIS AND RESULTS

In this section, we present observations of responses that may be useful to those interested in current valuation challenges, and we discuss the results in the context of existing work being done to address an issue, or identify issues where additional research is necessary. Section 3.1 presents important observations from specific questions, a few that cross-cut user classes. Section 3.2 looks at the larger cross-cutting questions that were designed to measure responses across the different user classes. Section 3.3 presents all of the individual user class data from "Question Types" as shown above in Table 2 through Table 9.

3.1. General Observations from Survey Results

3.1.1 Acceptance by Lenders and Underwriters

Residential Appraisers have had success at getting Underwriters to accept their valuation of the home with a PV system, when developed using PV Value® (Section 3.2.1). This provides evidence that was lacking in the marketplace where many appraisers were unsure of the basis for how to value a PV system when there were no comparable properties with PV, and many were unaware of how to develop and utilize a discounted cash flow model, such as the one employed by PV Value® to develop the contributory value of the PV system.

3.1.2 Green Addendum Usage

Many of the Residential Appraisers responded that they were not aware of the Appraisal Institute's Residential Green & Energy Efficient Addendum, AI Form 820.04 (Green Addendum). This would be expected from appraisers that have not yet encountered green features on a property, however this survey reached out to those who have utilized PV Value®, which has multiple references on the website and user manual to the Green Addendum. To get the fields populated and information added to MLS databases around the country, this form would need to be available to appraisers when they start the assignment. PV Value® Web will soon have a feature that will allow for inputs captured in the form to automatically populate the fields in PV Value®, saving appraisers time and ensuring the form is used. Real Estate Agents are somewhat aware of the form and have found it useful for capturing PV system detail (Section 3.3.3).

3.1.3 Shading of PV Systems

Residential Appraisers mentioned that shading was "very infrequent" (30%) with only 16% saying "somewhat infrequently" (Section 3.2.1). It is important that appraisers understand that shading may occur at different times of day and may not be visible during their site visit. Appraisers will need documentation from when the PV system was installed to understand the shading percentage at the time it was installed. Trees may continue to grow, or be removed, and other structures may have been installed during that time as well. Some companies are developing shading calculations to more accurately estimate shading to help with the solar sales process. This type of solution may be available to appraisers looking to determine shading impacts that may have changed since the PV system was installed.

3.1.4 Residential Appraisers Valuing Third-Party PV Systems

The answers to the question about whether and how a Residential Appraiser assigned value to a TPO PV system (Section 3.3.1) elicited many responses that ranged from valuing it only if it was a pre-paid lease fully assumable by a future buyer, to not valuing it at all if it's considered personal property not owned by the property owner. Existing TPO agreements state that the PV system is considered personal property owned by the third party, which can have impacts on the market value of a PV system (Klise and Johnson, 2014). Currently, there is no explicit guidance from FHFA (Fannie Mae, Freddie Mac), HUD (FHA) or the VA on how appraisers should look at TPO PV systems that are considered personal property. However, some guidelines do discuss, in general, how to treat personal property items.[2] PV systems owned by the homeowner are considered real property and can be more easily valued in a real estate transaction.

A question on whether a TPO PV system would be utilized by an appraiser in a comparable property analysis resulted in 53% stating they were "not sure" if they would use it. Only 20% stated "yes." This uncertainty in how to utilize TPO PV systems attached to a comparable property when considering the value of a PV system on the subject property is likely due to the uncertainty and lack of guidance from the federally backed mortgage holders and insurers on how to treat the personal property aspects of a TPO PV system.

3.1.5 Commercial Appraiser Discount Rate Development

Most Commercial Appraisers, when asked about what discount rates they use in their discounted cash flow analysis, had a pretty large range of sources both locally and nationally (Section 3.3.2). The *difference* in basis point spreads they utilized ranged between 100 and 200 points (1.0% to 2.0%). This is one area that will benefit from additional research as commercial appraisers typically have the understanding on how to develop the rates, though residential appraisers do not. Energy Sense Finance, LLC is currently developing a paper on how to calculate discount rates for use in valuing PV systems. The paper will cover how to develop the rate from choosing a risk-free rate to what basis point spread (risk) that should be added to develop a rate for use in PV Value® or other discounted cash flow calculations.

3.1.6 Listing of Home with PV System

Real Estate Agents utilized PV Value® for market analysis as well as developing a listing price for the PV portion of the home. The Multiple Listing Service questions revealed that there are some MLS fields being used to capture PV system information, though it's mostly within a comments field and not an active "PV" field. This will hopefully be changing soon as more MLS providers adopt the most recent Real Estate Standards Organization (RESO) Real Estate Transaction Standard (RETS), which now has fields that can be used to record PV system

[2] https://www.fanniemae.com/content/guide/selling/index.html & http://portal.hud.gov/hudportal/HUD?src=/program_offices/administration/hudclips/handbooks/hsgh/4150.2 & http://www.uspap.org/#/64/ (USPAP Standards Rule 7-4)

ownership.[3] The real estate agents can then attach a TPO agreement, or records that indicate the PV system is owned by the property owner.

3.1.7 Third-Party PV System Fair Market Value

We asked solar industry respondents whether they knew PV Value® could be used to develop the Fair Market Value (FMV) of a TPO system undergoing an ownership transfer (Section 3.3.7). Only a few stated they were aware the tool could be used for this purpose. As TPO systems are treated differently by the IRS due to the use of accelerated depreciation and other tax benefits, an arm's length transaction may be necessary; this means an independent source of the fair market value of the PV system must be determined by an uninterested party (Klise and Johnson, 2014). It is unclear how many TPO systems have undergone an ownership transfer (personal property to real property), though the tool would be useful for a valuation professional given an assignment to determine FMV.

3.1.8 Exercise Buyout of Lease or PPA

The question asked to homeowners that have a TPO PV system revealed that for those that could buy out their lease or PPA, the majority of responses (50%) were "not sure" if they would exercise that option, while the remaining 25% said they would, and 25% stated they would not. Those that responded to value under third-party ownership or owned shortly after (through a buyout) revealed that the PV system has "more value when owned" at 44%, 39% stated they were not sure, and a smaller amount (13%) stated that the value was the same regardless of ownership." There is still much uncertainty in the value of owned vs. TPO systems, as evidenced in the responses below in Figure 3 across all user classes that participated in this survey.

As the value proposition of the home is likely different when appraisers consider either the real or personal property aspects of an "owned" or TPO PV system, this uncertainty may make it more difficult for homeowners to understand the benefits of either staying in the lease or buying it out when the option is available.

3.2. Cross-Cutting Questions and Results

Some of the questions posed to each user group were the same, or somewhat similar. In this section, we explore a few of those questions to see what differences each group has when considering the market and fair market value of a solar PV system. Appendix B presents a color-coded matrix of questions that cross-cut each user class. The main cross-cutting questions for the specific user classes are summarized below in Table 10. Highlighted questions are discussed in more detail in this section.

[3] http://www.reso.org/rets

Table 10. Cross-Cutting Questions

Question[i]
In what zip code are you located?
How many times have you used the Photovoltaic (PV) Value® Tool for a job assignment in the past year?
Please explain your overall interest in the PV Value® tool
Did you make adjustments upwards or downwards from the range of values provided by the tool?
If PV system information was not available, were you still able make an estimate using PV Value®?
In addition to using PV Value®, did you use the cost approach or sales comparison approach when developing a value conclusion?
Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?
Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?
How recently have you taken a course on appraising solar PV systems?
How likely would you be to take an online course in valuing PV systems if the course met state certification CE requirements?
Does the local MLS in your area provide data entry fields for PV systems?
How frequently have you used PV Value® to develop the value of renewable energy credits (RECs or SRECs) or production based incentives (PBIs)?
Are you aware of Al Form 820.04 - Residential Green and Energy Efficient Addendum?
How beneficial would access to appraised values of PV systems in your market area be to your practice?
What would make the PV Value® tool more useful?
How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?

i – *Questions highlighted in grey are discussed in more detail below. These questions were chosen for further analysis as they cross-cut the largest number of user classes and represent insights germane to recent valuation challenges. The reader is encouraged to take a look at Section 3.3 and Appendix A to compare the answers of other cross-cutting questions that were not explored in more detail in this section.*

3.2.1 Adjustments Up or Down from PV Value® Estimates

We asked both residential and commercial appraisers that have utilized PV Value®, "*Did you make adjustments upward or downward from the range of values provided by the tool?*" The single-question data are presented in Sections 3.3.1 and 3.3.2, and highlighted in Figure 8 for commercial appraisers. See also Appendix A – PV Value® Survey for Residential Appraisers (Q4) and Commercial Appraisers (Q3). Results shown below in Figure 1 reveal that for both residential and commercial appraisers, most do not deviate from the appraisal range of value estimates provided by the tool, though when they do, most adjustments are made upward.

	Upward	Neither upward nor downward	Downward	Not applicable	Responses
Residential Appraisers	23%	49%	10%	18%	*88*
Commercial Appraisers	11%	44%	7%	39%	*46*

Figure 1. Responses for Adjustments Up and Down from PV Value® Estimates

These results suggest that in most cases, the value of the energy produced by the PV system, which is a function of the estimated solar resource, grid-tied electric rates and estimated escalation, and choice of discount rate, is not requiring adjustment by appraisers using the PV Value® tool. This could be reflective of the fact most PV systems are new and appraisers do not have additional market support to adjust much higher or lower than what can be developed using a discounted cash flow analysis. The exact basis for these adjustments was not elicited in this survey though it would be useful to follow up with appraisers to understand the basis for the adjustment.

3.2.2 Use of Cost Approach or Sales Comparison Approach

We asked both residential and commercial appraisers that have utilized PV Value® "*In addition to using PV Value®, did you use the cost approach or sales comparison approach when developing a value conclusion?*" The data are presented in Sections 3.3.1 and 3.3.2. See also Appendix A – PV Value® Survey for Residential Appraisers (Q6) and Commercial Appraisers (Q6). Results shown below in Figure 2 reveal that in addition to using PV Value®, commercial appraisers dominate in just the use of the cost approach, where residential appraisers dominate in the use of both cost and sales approaches. A close to equal percentage used just the sales comparison approach in addition to PV Value®. Only a small percentage of both residential and commercial appraisers utilized only the income approach in PV Value® when developing the value of a PV system.

	Cost approach	Sales comparison approach	Both cost and sales comparison approaches	PV Value (income) only	Not applicable	Responses
Residential Appraisers	13%	18%	35%	17%	17%	*88*
Commercial Appraisers	30%	13%	9%	20%	28%	*46*

Figure 2. Responses for Use of Cost Approach or Sales Comparison Approach

From the results shown above, it appears that appraisers are actively using the other approaches available to them to develop the value of the PV system, and not just the PV Value® tool. Comparable properties with PV systems may not be utilized as much in commercial appraisals, as the cost dominates typically dominates. A smaller percentage only uses the sales comparison approach in addition to PV Value®. Most commercial appraisers utilize the cost approach in addition to PV Value®.

3.2.3 Owned & TPO PV Systems Real Property Value Perception

We asked six of the user classes *"Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?"* The data are presented in Sections 3.3.1 through 3.3.8, excluding commercial appraisers as they have ways to value the income stream for both owned and TPO systems, and underwriters as there were not enough responses to include in the analysis. See also Appendix A – PV Value® Survey Results for the raw data. Results shown below in Figure 3 reveal that for customer owned PV systems, the predominant response (over 50%) believe that PV systems "add to value," with the next highest response of "not sure" with the highest response of 44% for government users.

For TPO systems, the same question elicited the highest response of 50% that they "add to value" from lenders & loan officers, and higher responses of "neither add to nor reduce value" for the TPO category when compared to the question on "owned" PV systems. There were only a few respondents that thought TPO systems "reduce value." The largest number of responses for TPO systems was "not sure." Most homeowners that took the survey stated "not applicable" when asked about TPO systems, suggesting they do not have an agreement with a TPO provider for a PV system.

It is important to note that we did not ask which solar industry respondents installed customer owned PV, third-party PV, or a combination of both. It is also worth mentioning that as discussed below in Section 3.3.7, most of the PV systems were "owned" by homeowners and not third-party owned, which is reflected in the results shown for the homeowner category in Figure 3.

		Add to value	Neither add to nor reduce value	Reduce value	Not sure	Not applicable	Responses
Owned	Residential Appraisers	81%	8%	0%	12%		*87*
	Real Estate Agents	90%	10%	0%	0%		*10*
	Lenders & Loan Officers	67%	0%	0%	33%		*6*
	Government Users	56%	0%	0%	44%		*18*
	Solar Industry Professionals	86%	4%	0%	10%		*79*
	Homeowners	74%	0%	0%	7%	19%	*58*
TPO	Residential Appraisers	15%	27%	8%	50%		*86*
	Real Estate Agents	10%	40%	0%	50%		*10*
	Lenders & Loan Officers	50%	0%	0%	50%		*6*
	Government Users	22%	11%	6%	61%		*18*
	Solar Industry Professionals	32%	23%	13%	33%		*79*
	Homeowners	21%	0%	3%	3%	74%	*38*

Figure 3. Responses for Perception of Value Based on Ownership

Across all users that responded, the results indicate a higher degree of certainty that an "owned" PV system adds value to a property, whereas there is greater uncertainty as to whether that value can be added when considering a TPO PV system. This survey does not get into the more detailed questions that each user class would consider and their basis for that perception.

It is worth mentioning that these perceptions may be based on evidence seen in the marketplace in California (Hoen et al. 2011; 2013), and results from a study in north Denver for the Colorado Energy Office (2013) that reveals support and price premiums for "owned" PV systems.

Much of the uncertainty in whether a TPO PV system adds value to real property may have to do with the fact the PV system is not owned by the property owner, and that it is considered personal property and not real property.

In a home transaction, there are multiple ways a TPO PV system can be transferred either as personal property (if lease payment and/or terms are transferred), or real property (if lease or PPA is bought out). As there have not been any recent studies to date that explore these real estate transactions and impacts to property value when a TPO PV system is involved, this is likely reflected in the responses by the survey participants. As future studies are conducted to study TPO PV impacts to value, this uncertainty will likely be reduced.

3.2.4 Appraised Value of PV Systems – Beneficial to Professional Practice

We asked residential and commercial appraisers, and real estate agents that have utilized PV Value® *"How beneficial would access to appraised values of PV systems in your market area be to your practice?"* The data are presented in Sections 3.3.1, 3.3.2, and 3.3.3. See also Appendix A – PV Value® Survey for Residential Appraisers (Q27), Commercial Appraisers (Q15), and Real Estate Agents (Q15). Results shown below in Figure 4 reveal that these three user classes believe a database of PV system appraised values would be beneficial to their practice.

	Very beneficial	Beneficial	Somewhat beneficial	Not beneficial at all	Not sure	Responses
Residential Appraisers	44%	22%	23%	5%	7%	*88*
Commercial Appraisers	42%	33%	13%	4%	8%	*48*
Real Estate Agents	60%	20%	20%	0%	0%	*10*

Figure 4. Responses for Appraised Value of PV Systems – How Beneficial to Professional Practice

3.2.5 Use of PV Value® on a Web-Based Platform

We asked seven of the user classes *"How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?"* The data are presented in Sections 3.3.1 through 3.3.8, excluding Underwriters, as there were not enough responses to include in the analysis. See also Appendix A – PV Value® Survey Results for the raw data. Results shown below in Figure 5 reveal that most users would continue to use PV Value® when it moves to a web version. Lenders & loan officers responded the highest with "not sure" when asked this question.

	Very likely	Somewhat likely	Neither more nor less likely	Somewhat unlikely	Very unlikely	Not sure	Responses
Residential Appraisers	70%	12%	6%	0%	1%	11%	*89*
Commercial Appraisers	50%	21%	15%	0%	4%	10%	*48*
Real Estate Agents	80%	10%	0%	0%	0%	10%	*10*
Lenders and Loan Officers	50%	17%	0%	0%	0%	33%	*6*
Government Users	59%	24%	6%	0%	0%	12%	*17*
Solar Industry	53%	25%	6%	3%	5%	9%	*80*
Homeowners	49%	25%	10%	3%	2%	10%	*67*

Figure 5. Responses for Use of PV Value® on a Web-Based Platform

From the responses above, most users of PV Value® will likely continue to use it when it moves from the proof-of-concept spreadsheet to a web version. This likely reflects the potential the tool brings to real estate and valuation professionals as well as the success that users have had at facilitating transactions of properties with PV systems. As PV Value® Web is in a public beta release at the time of this publication, these results are encouraging. There are multiple suggestions by tool users that will be considered for future improvements; these can be read in Appendix A.

3.3. Individual Survey Results

In this section, we present individual survey results for each of the user groups, with the exception of the underwriter group as there was only one response; results were inconclusive at this time to gather any useful information about how they are utilizing the PV Value® tool. The summarized survey responses to each question, including open-ended responses, are presented in Appendix A. Some open-ended answers are partially redacted due to the inclusion of personally identifiable information by the survey participant, though these redactions did not alter the essence of the response.

3.3.1 Residential Appraisers

The questions as presented in Table 2 are discussed below and grouped according to the "Question Type" column with summarized results. Appendix A has a detailed summary of each individual question collected from the survey tool

Markets where Homes with PV are being Bought and Sold – The top five locations of the 89 survey participants from highest to lowest were in the following states: California, Arizona, New Mexico, Colorado and Hawaii. There were also participants in states on the East Coast, Midwest and Puerto Rico.

Frequency of Use – Most appraisers have utilized the PV Value tool at least 1 to 2 times in the past year (30%), 3 to 4 times in the past year (19%), 5 or more times in the past year (28%), and 21% of respondents have not used it in the past year.

Market Influence on Value – 49% of residential appraisers did not adjust the value of the PV system above or below the value obtained in the PV Value® tool. A smaller portion (23%) adjusted the value upwards, while only 10% adjusted the value downwards. We did not ask how much adjustment was made, nor did we capture adjustments relative to other approaches, such as cost or sales comparison.

How Comparables are Viewed & Use of Other Approaches – Overall, 35% of residential appraisers used both cost and sales comparison approaches, in addition to using PV Value®. 18% used only sales comparison in addition to PV Value®, and 12% used only the cost approach in addition to PV Value®, while 17% of respondents used the PV Value® tool exclusively when developing a value conclusion.

There are not enough comparable properties [within their market] to use the sales comparison approach with PV systems, according to 69% of residential appraisers, with 24% suggesting that there are enough properties. 7% of participants chose not to answer. These responses cut across all markets represented by survey participants.

Many open-ended responses were gathered for the question on how residential appraisers are trying to use paired sales to develop the value of a PV system (Appendix A – PV Value® Survey for Residential Appraisers Q8), though challenges remain based on the responses above. A few of the responses are shown below:

- *Often if a comparable property was found with solar, the issue is that you do not have the data of that solar system to arrive at any conclusion between the two.*
- *The problem is finding PV comparables. Although PV systems are common in my market, they are not a reported field in MLS. Furthermore, we need to know if they are owned or leased.*
- *Paired sales in Hawaii are hard to do because we don't have cookie cutter homes. All are unique and there are a lot of different ways solar/pv systems are being purchased, so all of that has to be taken into consideration.*
- *Research the permit information. Usually I find it. If I don't, then I ask the agent what size the system was. Then I disclose what I can't know about the system, estimate value based on my past experience.*

A follow-on question regarding how information on PV systems is found, in terms of size, age, and condition to support a paired sales approach (Appendix A – PV Value® Survey for Residential Appraisers Q9) included these responses:

- *I can get data from the installation/selling PV dealer if it is one of the local companies.*
- *MLS, calling the listing realtor who actually had the info on the paired sale PV system, amazingly.*
- *Developers and builders first, then installers and providers, and finally by cold calling and knocking on doors (very painful!).*
- *Major searching. If it's not retained in the permit, then it's very hard to find at all.*
- *Green Addendum from the Realtor® or Broker.*

Interface with Underwriting – In cases where it was *known* if the underwriter either accepted or rejected the valuation of the PV system, 90% of the respondents said the PV valuation was accepted. We did not ask if other approaches were also included along with the use of PV Value®. From the total sample of all responses, 42% of residential appraisers were unsure if the valuation of the PV system was accepted by the underwriter (Figure 6).

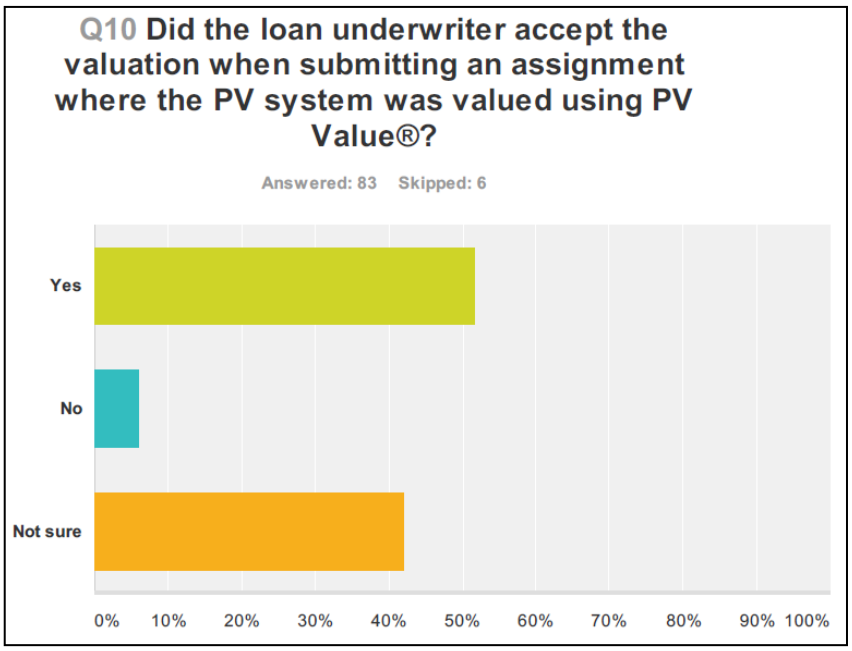

Figure 6. Loan Underwriter Acceptance of Valuation where PV Value® is Used

A question was then asked about why the PV system valuation was not accepted by the underwriter, however the responses were not conclusive with respect to the question. See Appendix A – PV Value® Survey for Residential Appraisers Q10, Q11.

Education of Appraiser – Most residential appraisers (52%) have not taken a course on PV valuation with only 5% at the time of this survey signed up for a future offering of a course. The remaining 43% have taken a course on valuing PV systems, likely the one offered by the Appraisal Institute.[4] A subsequent question was asked regarding the likelihood that appraisers would take an online course if it could apply for continuing education credits. Overall, 56% and 21% were either very likely, or somewhat likely, respectively, to take an online course. (See Appendix A – PV Value® Survey for Residential Appraisers Q12, Q13).

Data Capturing and Entry – These questions refer to those in Appendix A – PV Value® Survey for Residential Appraisers, Q14, Q3, Q15, Q16, Q17, Q18, and Q5. A question on how frequent does the MLS provide information on PV systems resulted in 32% responding "very infrequently." Only 19% stated "somewhat frequently." Only 6% of residential appraisers say that the MLS "always" provides details about the presence of PV systems in their market.

[4] http://www.myappraisalinstitute.org/education/course_descrb/Default.aspx?prgrm_nbr=844&key_type=C

The ease to which obtaining information from homeowners was expressed by residential appraisers as "somewhat easy" for 40% of the responses followed by "somewhat difficult" for 21% of the responses (See Appendix A – PV Value® Survey for Residential Appraisers Q3).

Appraisers are "very likely" (70%) to continue to use the PV Value® tool when it moves to a web-based platform (See Appendix A – PV Value® Survey for Residential Appraisers Q15).

With regards to the Appraisal Institute's Residential Green & Energy Efficient Addendum, AI Form 820.04,[5] most residential appraisers have "never" used it to enter PV system characteristics (34%), while only 17% have "always" used it (See Appendix A – PV Value® Survey for Residential Appraisers Q16). Those who have not used it provided open-ended responses, some of which are highlighted here, and can be read in their entirety in Appendix A – PV Value® Survey for Residential Appraisers, Q17:

- *Not necessary or required.*
- *Not familiar with it, nor have I needed to. I'm sure in the future I will.*
- *Underwriters do not require the form.*
- *May of the automated web platforms for uploading appraisal reports to not allow that particular form to be attached to residential report.*

A question on whether the PV system will be shaded at different times of day, during their assessment of the property, had responses that suggested 30% of appraisers think shading will be "very infrequent," followed closely by 19% that said "never." Only 16% responded "somewhat infrequently." (Appendix A – PV Value® Survey for Residential Appraisers Q18).

Of those appraisers that responded yes/no to a question on making an estimate using PV Value® even if the PV system information was not available, just over half of those said they were able to make an estimate (Appendix A – PV Value® Survey for Residential Appraisers Q5).

PV System Ownership Impacts to Value – 6 questions addressed this area due to the importance of appraisers understanding who owns the PV system, whether it is the homeowner, or a third-party. (Appendix A – PV Value® Survey for Residential Appraisers Q19-24). Most appraisers that responded to this survey have not yet encountered a third-party owned PV system (lease or PPA) (34%), while 21% have "somewhat frequently" encountered this type of ownership structure.

A question on assigning value revealed that overall, most residential appraisers did not assign value to a third-party owned PV system (44%), while 14% did assign value. Of the responses, 41% said this was "not applicable" as they likely haven't yet encountered a third-party owned PV system in their assignments. (Appendix A – PV Value® Survey for Residential Appraisers Q20). An open-ended question (Q21) revealed the following about methods utilized for developing value for a third-party owned PV system:

[5] http://www.appraisalinstitute.org/assets/1/7/AI_820_04-Residential_Green_and_Energy_Effecient_Addendum.pdf

- *Only if it is a pre-paid lease and fully assumable by future buyers.*
- *Paired sales and new builder option cost.*
- *If encountered I would not assign any value to the property [PV system] being appraised unless the system reverted to the owner in less than 5 years and the warranty had over 5 years left on it.*
- *Net present value of savings or a capitalization rate applied to net operating income.*
- *n/a it is personal property if not owned by the property owner.*

When asked about considering a third-party owned PV system in a comparable property analysis, most residential appraisers were "not sure" (53%), followed by "no" at 27% and "yes" at 20%. (Appendix A – PV Value® Survey for Residential Appraisers Q22).

Owned PV systems overwhelmingly add to the value of real property in a real estate transaction, according to 80% of appraisers (none said it would reduce value), while only 15% of appraisers believe third-party PV systems add to value of real property, with much more uncertainty for the third-party owned PV system (Figure 7) (Appendix A – PV Value® Survey for Residential Appraisers Q22, Q23).

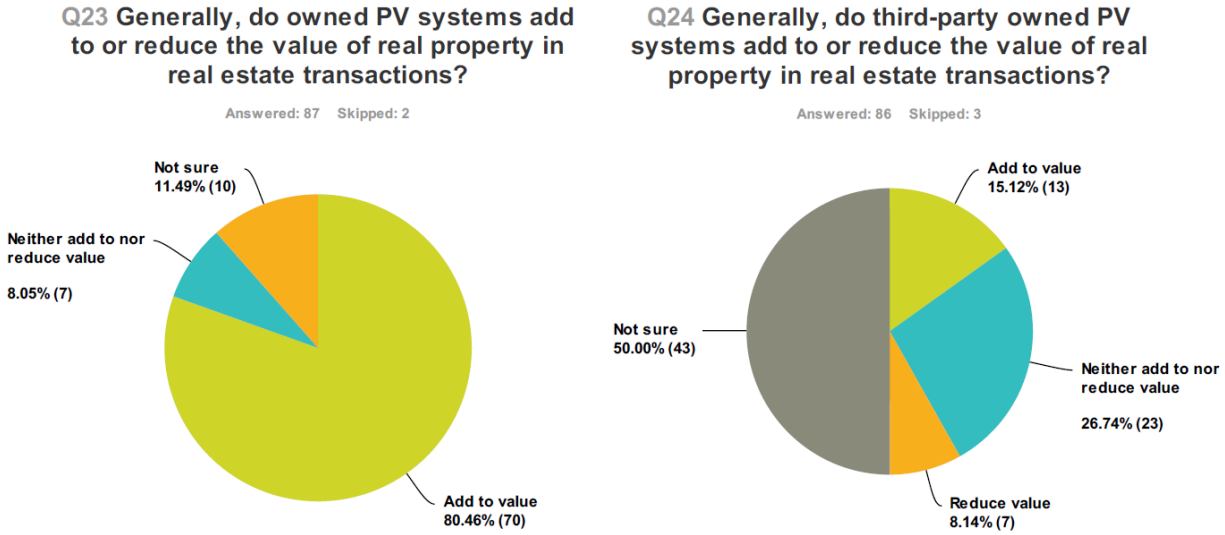

Figure 7. Residential Appraiser Perceptions on Ownership and PV System Value

Valuing Renewable Energy Credits – As the tool can be used to value Renewable Energy Credits (RECs) in some markets, we asked how frequent they have used the tool to develop the value. Most residential appraisers have "never" used the tool (67%) to value RECs, followed by 17% at "very infrequently." Only 2% have valued RECs "very frequently" using PV Value®. (Appendix A – PV Value® Survey for Residential Appraisers Q24).

Functional Obsolescence – Residential appraisers may consider obsolescence when developing value as the PV system may be oversized compared to other PV systems nearby, or using a technology that is outdated or experimental. We asked how many would consider this when valuing a home with a PV system, and 27% responded with "never," with 18% as "very infrequently." Only 14% stated they would "very frequently" consider functional obsolescence

when valuing a home with a PV system (Appendix A – PV Value® Survey for Residential Appraisers Q26).

PV Value® Web Analysis Products – Most all residential appraisers said that having access to appraised values of PV systems in their market area would be beneficial (88%) (Appendix A – PV Value® Survey for Residential Appraisers Q27).

Improvement Requests – There were multiple improvement requests from residential appraisers, with the most common features shown below, though a full list can be found in Appendix A (PV Value® Survey for Residential Appraisers Q28):

- *Web-based tool – easier to use.*
- *On-line course (PV Value® and concepts).*
- *Local data of kWh cost.*
- *Local, typical installation costs.*
- *Better MLS information from Realtors®.*
- *Information on discount rates.*

3.3.2 Commercial Appraisers

The questions as presented in Table 3 are discussed below and grouped according to the "Question Type" column with summarized results. Appendix A has a detailed summary of each individual question collected from the survey tool.

Markets where Homes with PV are being Bought and Sold – The top five locations of the 49 survey participants from highest to lowest were in the following states: California, Massachusetts, Texas, New York, and Florida. There were users in many other states as well (Appendix A – PV Value® Survey for Commercial Appraisers Q1).

Frequency of Use – Most appraisers have utilized the PV Value® tool at least 1 to 2 times in the past year (35%), 5 or more times in the past year (18%), 3 to 4 times in the past year (14%), and 31% of respondents have not used it in the past year. Only 2% were not sure (Appendix A – PV Value® Survey for Commercial Appraisers Q2).

Market Influence on Value – 43% of residential appraisers did not adjust the value of the PV system above or below the value obtained in the PV Value® tool (Figure 8). A smaller portion (7%) adjusted the value downwards, while 11% adjusted the value upwards. 39% likely have not yet utilized it for an assignment and stated "not applicable."

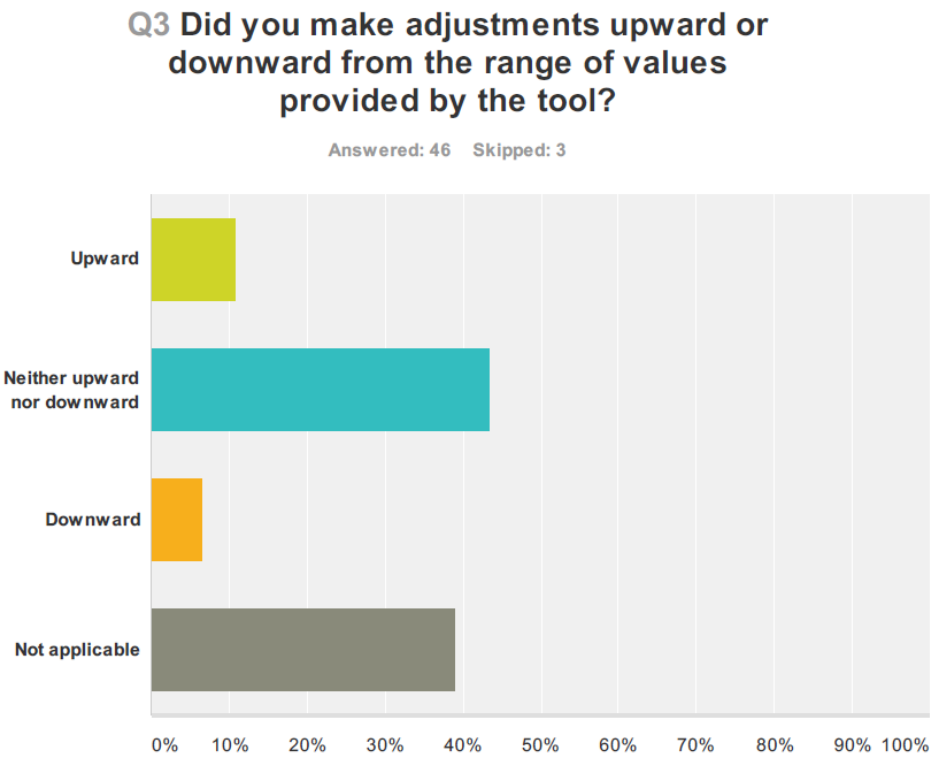

Figure 8. Commercial Appraiser Adjustments of PV Value® Results

Data Capturing and Entry – Commercial appraisers believe it was "somewhat easy" to obtain information about the PV system from the property owner (44%), with 27% saying they did not obtain information from the property owner. Only 4% stated that it was "very difficult" to obtain PV system information from the property owner (Appendix A – PV Value® Survey for Commercial Appraisers Q4). Of those that were not able to gather information about the PV system 87% said they were still able to make an estimate of value using PV Value® (out of yes/no responses) (Appendix A – PV Value® Survey for Commercial Appraisers Q5).

Most commercial appraisers (85%) say they will continue to use PV Value® when it is available as a web version (Appendix A – PV Value® Survey for Commercial Appraisers Q13).

How Comparables are Viewed & Use of Other Approaches – Around 30% of commercial appraisers used the cost approach in addition to PV Value® (income approach), followed by 13% using sales comparison and PV Value®. Only 8% used all three approaches (cost, sales comparison and income). 20% of commercial appraisers used PV Value® to develop the income approach only in their assignment (Appendix A – PV Value® Survey for Commercial Appraisers Q6).

Education of Appraiser – From the total number of responses, 62% of commercial appraisers have taken a course on appraising a solar PV system, likely the one offered by the Appraisal Institute.[6] The remainder of commercial appraisers has not taken a course, with 2% responding

[6] http://www.myappraisalinstitute.org/education/course_descrb/Default.aspx?prgrm_nbr=844&key_type=C

they were not sure if they've taken a course on appraising solar PV systems (Appendix A – PV Value® Survey for Commercial Appraisers Q7).

Overall, commercial appraisers would be "very likely" (48%) to take a course on valuing PV systems if it met state certification requirements. At the other end of the spectrum, only 6% said they would be "very unlikely" to take a course even if it did meet state certification requirements (Appendix A – PV Value® Survey for Commercial Appraisers Q8).

Development of Discount Rate – Two open-ended questions were asked of commercial appraisers to understand where they get their risk-free rate, and what basis point spread they use in their assignments. Full detailed responses are in Q9 and Q10 in Appendix A (PV Value® Survey for Commercial Appraisers). Responses on where commercial appraisers get their risk free rate are shown below:

- *Treasury Bonds (10-year, 20-year, 30-year).*
- *Land lease rates.*
- *Interviews with users, banks, appraisers.*
- *LIBOR, Fed Advanced Rate.*
- *Survey from AI Journal.*
- *Corporate bond rates – Financial Data Report, St. Louis Federal Reserve.*
- *Bloomberg.*

A sampling of the basis point spread used by commercial appraisers for valuing PV systems is as follows:

- *250 to 350*
- *150 to 350*
- *150 to 250*
- *300 to 400*
- *50 to 200*
- *Difference between 5-year Treasury and 5-year AAA Bonds, or 5-year AAA Bonds and 5-year A Bonds.*
- *Depending on if it was existing or proposed – but for commercial proposed sites, usually a 200 point spread.*

Use of other DCF models – Many commercial appraisers utilize other spreadsheet tools, either developed internally or purchased commercially. Only 27% of appraisers used a tool other than PV Value® to value their own PV system, primarily internally created excel DCF spreadsheets (Appendix A – PV Value® Survey for Commercial Appraisers Q11, Q12).

Valuing Renewable Energy Credits – A majority of commercial appraisers have not used PV Value® to develop the value of RECs (60%). The remaining 40% have used it to develop RECs, though only 10% of those used it on a frequent basis (Appendix A – PV Value® Survey for Commercial Appraisers Q14).

PV Value® Web Analysis Products – Most all commercial appraisers say that having access to appraised values of PV systems in their market area would be beneficial (88%) (Appendix A – PV Value® Survey for Residential Appraisers Q15).

Improvement Requests – There were multiple improvement requests from commercial appraisers, with the most common features shown below, though a full list can be found in Appendix A (PV Value® Survey for Commercial Appraisers Q16):

- *Integrated definition of the terms used, through pop-ups / glossary of defined terms and a key that helps with unit conversion.*
- *A REC [renewable energy credits] module / another line of income for SRECs and a separate discount rate.*
- *Better guidance to accepted discount rates. Even our institutional clients are generally in the dark on this.*
- *More properties that have a PV system in place so we could get comparables and perform appraisals for this type of property.*

3.3.3 Real Estate Agents

The questions as presented in Table 4 are discussed below and grouped according to the "Question Type" column with summarized results. Appendix A has a detailed summary of each individual question collected from the survey tool.

Markets where Homes with PV are being Bought and Sold – The top five locations of the 10 survey participants from highest to lowest were in the following states: Arizona, California, New Mexico, Nevada, and Massachusetts (Appendix A – PV Value® Survey for Real Estate Agents Q1).

General Feedback – This was an open-ended question with responses that ranged from the user being a green realtor, an educator on sustainable and green homes, an Eco Broker, to a "Top 10 US Builder" (Appendix A – PV Value® Survey for Real Estate Agents Q2).

Knowledge of PV Systems – We asked if any of the respondents have listed a home with a PV system in the past 5 years, with 60% saying "yes," with the range of those who have listed homes with PV, 22% listed 1 to 2 homes, 11% listed 2 to 3 homes, 11% listed 4 to 5 homes and 22% listed 5 to 6 homes. The remaining 34% had not listed homes with PV and selected "N/A" (Appendix A – PV Value® Survey for Real Estate Agents Q3, Q4).

Sales Velocity – Of the respondents that understood how fast the home sold with PV, 33% stated the home sold "quickly" compared to a home without a PV system, while 22% stated that the home sold in the same amount of time as a home without a PV system (Figure 9). 45% were not sure. (Appendix A – PV Value® Survey for Real Estate Agents Q5).

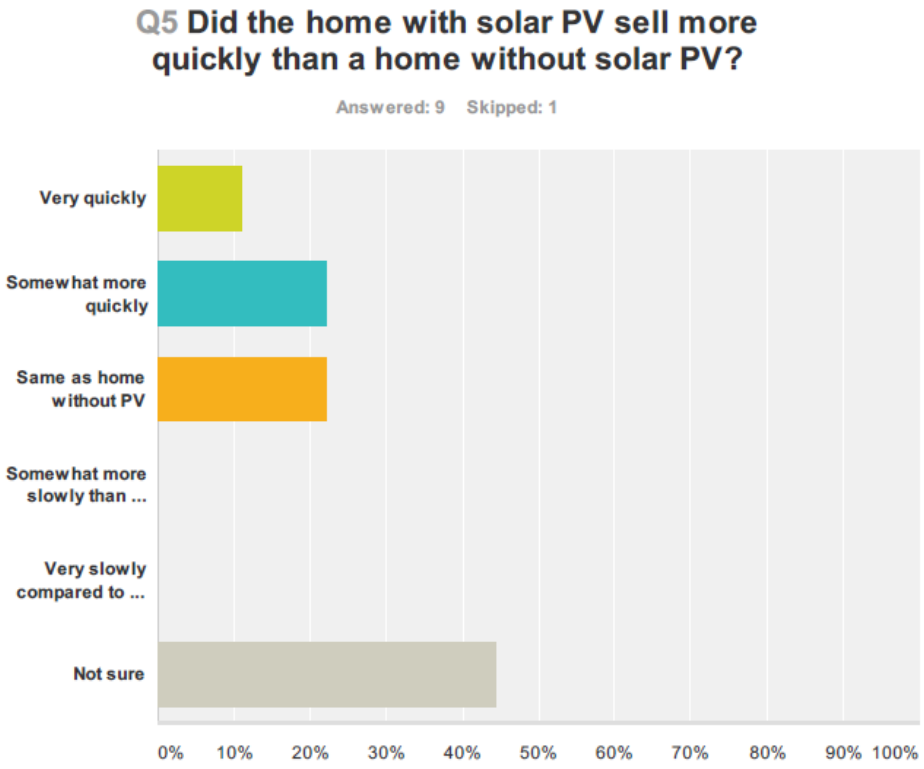

Figure 9. Sales Velocity of Home Sold with PV System

Develop Listing Price – The real estate agents who responded said they have suggested PV Value® to homeowners (60%), while 20% did not suggest the homeowner utilize the tool. To help develop the price, 70% of real estate agents who responded, utilized PV Value® to develop the value as part of a market analysis, while 30% said they did not (Appendix A – PV Value® Survey for Real Estate Agents Q6, Q7).

Use of Multiple Listing Service – Four questions were asked concerning the availability and utilization of the MLS for capturing and conveying PV system information to prospective buyers and buyer's agents. 40% of real estate agents said the MLS provides data entry fields for PV systems; however 40% of them were not sure if the fields were present. Only 20% were sure there were no PV specific MLS fields. The fields typically utilized in the MLS were "comments, remarks or features," with a few stating there was an "Active Solar" field as well as a "Green Features" field (Appendix A – PV Value® Survey for Real Estate Agents Q8, Q9).

Out of the real estate respondents, only 40% were aware of the Appraisal Institute's Form 820.04 – Residential Green and Energy Efficient Addendum. Of those that have used it, they found it helpful when capturing the details of the PV system (Appendix A – PV Value® Survey for Real Estate Agents Q10, Q11).

PV System Ownership Impacts to Value – When asked about whether PV systems add to the value in a real estate transaction, 90% stated "yes." When asked about third-party owned PV systems, only 10% responded that it added value, 40% said it had no impact to the real property

value and 50% were unsure (Appendix A – PV Value® Survey for Real Estate Agents Q12, Q13).

User Interest and Satisfaction – When asked whether they would continue to utilize PV Value® as a web application, "very likely" was the response by 80% of real estate agents (Appendix A – PV Value® Survey for Real Estate Agents Q14).

PV Value® Web Analysis Products – All real estate agents said that having access to appraised values of PV systems in their market area would be beneficial, with 60% of those stating it would be "very beneficial" (Appendix A – PV Value® Survey for Real Estate Agents Q15).

Improvement Requests – This open-ended question resulted in answers that included the following (Appendix A – PV Value® Survey for Real Estate Agents Q16):

- *Simplify.*
- *Have it sent to all licensed appraisers and lenders.*
- *Easier to populate slope and orientation.*
- *Include the value of SRECs, ZRECs, or other state incentives in a variable line.*

3.3.4 Lenders & Loan Officers

The questions as presented in Table 5 are discussed below and grouped according to the "Question Type" column with summarized results. Appendix A has a detailed summary of each individual question collected from the survey tool.

Markets where Homes with PV are being Bought and Sold – The top locations of the 6 survey participants from highest to lowest were in the following states: California, Vermont and Arizona (Appendix A – PV Value® Survey for Lenders and Loan Officers Q1).

General Feedback – Open-ended questions elicited responses including the following (Appendix A – PV Value® Survey for Lenders and Loan Officers Q2):

- *Recommend valuation tool to clients, appraisers and others to establish database for solar value contribution to house value.*
- *We need tools to track and demonstrate the added value to homes when solar is installed. We also need tools which can help homebuyers understand the different value of the same physical system if it is owned versus leased monthly versus leased prepaid.*
- *We are using the PV Value® tool to provide values of proposed PV systems to determine the amount of mortgage proceeds to lend.*

PV System Ownership Impacts to Value – Of the respondents, 67% said that owned PV systems add to the value of real property in a real estate transaction, and 33% were not sure. When asked about third-party owned PV systems, 50% of lenders and loan officers that responded stated they add to value, and 50% were not sure if they add value (Appendix A – PV Value® Survey for Lenders and Loan Officers Q3, Q4).

Knowledge of PV Systems – When asked an open-ended question about challenges that make it difficult to understand the value of a PV system, responses included the following (Appendix A – PV Value® Survey for Lenders and Loan Officers Q5):

- *Uncertainty of what kWh costs will be in the future.*
- *Market comps difficult to ID. Real estate agents don't care or work against.*
- *There are few comps available to demonstrate the added value of solar from a market based perspective, and the same physical system can have a very different value depending on who owns it and under what terms. It is difficult for realtors and appraisers to understand these differences.*

Understanding of Risk – When asked whether a PV system adds to loan risk when including the value in the property, 33% stated "yes," and 33% stated "not sure." 17% stated there was no added risk, and 17% said this was not applicable (Figure 10). Only a few insights from an open-ended question on how that risk can be remediated were given; one stated that changing electricity rates or system failure add to the risk, and another stated that the risks can be mitigated, but offered no specific examples (Appendix A – PV Value® Survey for Lenders and Loan Officers Q6, Q7).

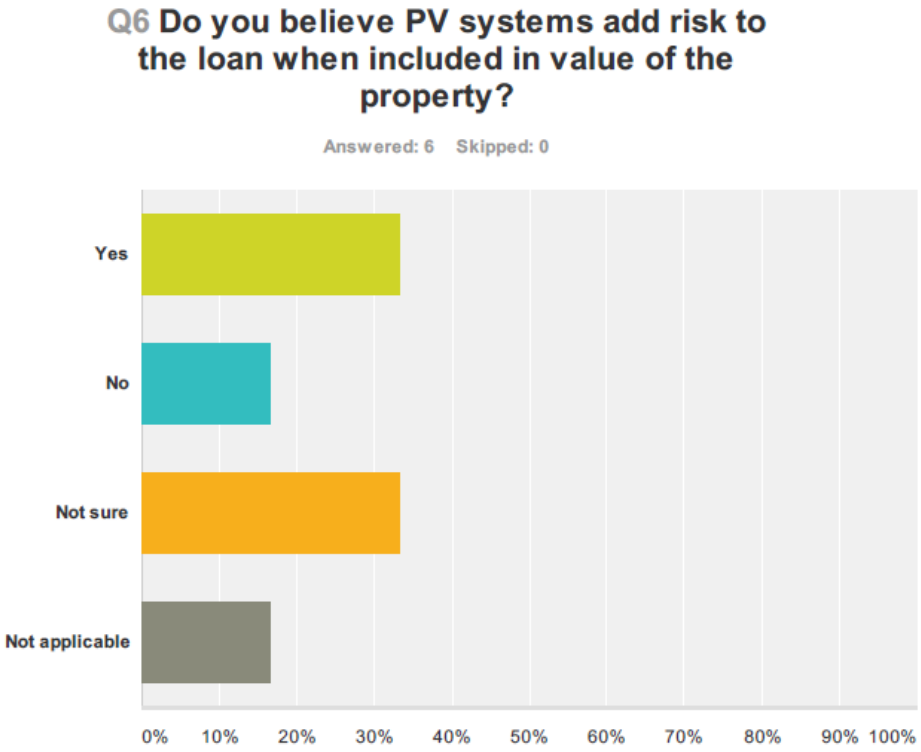

Figure 10. Risk Perception by Lenders and Loan Officers

Interactions with Federal Underwriters – To understand if lenders and loan officers perceive there are any restrictions on value that come from federal mortgage backers, 20% said they are aware of some restrictions, while 40% stated they were not aware, and 40% stating they were not sure. One respondent stated they are working with Fannie and Freddie to recognize the energy

"savings" from a PV system in *multi-family* mortgage underwriting (Appendix A – PV Value® Survey for Lenders and Loan Officers Q8, Q9).

User Interest and Satisfaction – 67% of lenders and loan officers are likely to continue using PV Value® as a web application, with the remaining 33% not sure (Appendix A – PV Value® Survey for Lenders and Loan Officers Q10).

Improvement Requests – Some feedback for improvement included the following (Appendix A – PV Value® Survey for Lenders and Loan Officers Q11):

- *More nuanced rate database. IOU in CA much more expensive rates. Useful to include details.*
- *Better descriptions of how to enter historical data for a site to get accurate assessment of system performance, as well as better descriptions of the financial terms and assumptions to use.*

3.3.5 Underwriters

The questions are presented in Table 6 above. Appendix A has a detailed summary of each individual question collected from the survey tool.

There was only one response for the underwriter questions; the results did not contain useful information to share in this analysis.

3.3.6 Government Users

The questions as presented in Table 7 are discussed below and grouped according to the "Question Type" column with summarized results. Appendix A has a detailed summary of each individual question collected from the survey tool.

Markets where Homes with PV are being Bought and Sold – The top locations of the 18 survey participants from highest to lowest were in the following states Vermont, Massachusetts and Texas (Appendix A – PV Value® Survey for Government Users Q1).

General Feedback – Open-ended questions elicited responses including the following (Appendix A – PV Value® Survey for Government Users Q2):

- *Research and value assessment.*
- *I work in city assessment office. We do value solar energy improvements – although they are exempt for 15 years.*
- *Assessor's Office – valuing solar systems in place at the time of property transfer and/or reassessment.*
- *Government agency interest in promoting tools that assist in the valuation of renewable energy improvements.*
- *Very interested since the Vermont Tax Department has suggested we use it.*

How PV Value® is being used – Most respondents stated they used PV Value® for assessment purposes (72%), for appraisals (11%), other (11%) and not applicable (6%). In the "other" category, it has been used for education for a residential new construction energy efficiency program, and to examine outcomes of residential solar installations (Appendix A – PV Value® Survey for Government Users Q3, Q4).

For municipalities that exempt PV systems from assessments, 46% still track added value, with 27% not tracking value, and 27% not sure (Figure 11) (Appendix A – PV Value® Survey for Government Users Q9).

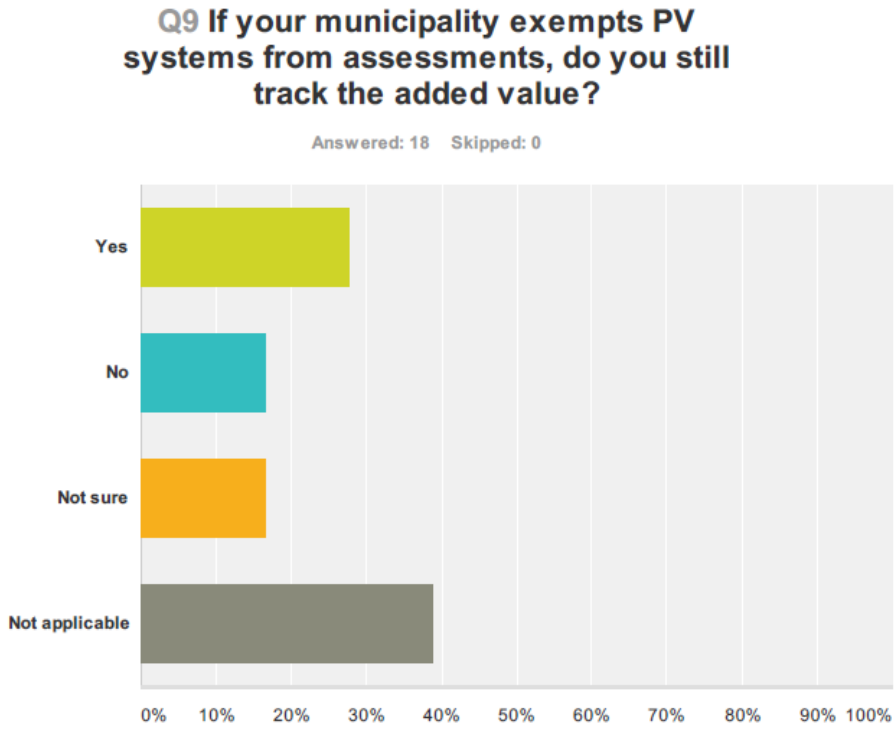

Figure 11. How Value is Tracked by Municipalities

PV System Ownership Impacts to Value – Of the respondents, 56% said that owned PV systems add to the value of real property in a real estate transaction. 44% were not sure. When asked about third-party owned PV systems, 22% of government users responded stated they add to value, 11% said value is neither added nor reduced, 6% say value is reduced and 61% were not sure (Appendix A – PV Value® Survey for Government Users Q5, Q6).

How Comparables are Viewed & Use of Other Approaches – For assessors that responded (55% applicable) 70% use only the income approach in PV Value®, 10% use only the sales comparison approach, none use only the cost approach, and 20% use a combination of the three approaches (Appendix A – PV Value® Survey for Government Users Q7).

When assessors were asked about whether the income value developed using PV Value® is greater or less than when using the cost approach, 46% were not sure, 36% said the income

approach using PV Value® is lower, and 18% said the income approach using PV Value® is more or less the same as the cost approach (Appendix A – PV Value® Survey for Government Users Q8).

User Interest and Satisfaction – 83% of government users are likely to continue using PV Value® as a web application, with 6% neither more nor less likely, and 11% not sure (Appendix A – PV Value® Survey for Government Users Q10).

PV Value® Web Analysis Products – Having access to appraised values of PV systems is seen overall as "beneficial" to 95% of government users, with only 5% stating that this data is "not beneficial at all" (Appendix A – PV Value® Survey for Government Users Q11).

Improvement Requests – Open-ended questions on improving PV Value® returned the following (Appendix A – PV Value® Survey for Government Users Q12):

- *A quick tutorial.*
- *Direct interface with appraisal Green Addendum; broader database on renewable production benefits and valuation.*
- *More exporting capabilities for written reports.*
- *A more thorough accounting of O&M expenses and how they are discounted.*

3.3.7 Solar Industry

The questions as presented in Table 8 are discussed below and grouped according to the "Question Type" column with summarized results. Appendix A has a detailed summary of each individual question collected from the survey tool.

Markets where Homes with PV are being Bought and Sold – The top 5 locations of the 80 survey participants from highest to lowest were in the following states: California, Arizona, New York, Texas and Washington (Appendix A – PV Value® Survey for Solar Industry Professionals Q1).

General Feedback – There were numerous responses on user interest in PV Value®, a few are shown below (Appendix A – PV Value® Survey for Solar Industry Professionals Q2):

- *To demonstrate the added value of a solar system to a home.*
- *We are selling PV systems to general contractors and green builders who are flipping houses and need to quantify value.*
- *Provide to appraiser for evaluation of property value.*
- *Working with builders to make PV available to buyers by mortgaging cost.*
- *To project future depreciated values of residential PV systems.*
- *Valuation of PV systems when donated to a non-profit.*
- *Involved in "Solarize" program, and want to find tools to value PV systems*.

User Type – Of the solar industry respondents, 40% identified themselves as third-party solar PV providers, and 51% did not identify as third-party providers. Only 9% said the question was not applicable (Appendix A – PV Value® Survey for Solar Industry Professionals Q5).

PV Value® in the Sales Process – Most respondents said they used PV Value® to sell a PV system (44%) with 19% saying they've used it to sell a lease/PPA. 37% said they were not sure (Appendix A – PV Value® Survey for Solar Industry Professionals Q3).

As far as impact in the sales process, PV Value® had "some impact" according to 50% of respondents, with 21% saying "no impact," 7% saying it had a "large impact," and 22% were not sure (Appendix A – PV Value® Survey for Solar Industry Professionals Q4).

PV System Ownership Impacts to Value – According to solar industry professionals, 86% say an owned PV system adds to the value of property in a real estate transaction, with 4% as neutral, and 10% not sure (Appendix A – PV Value® Survey for Solar Industry Professionals Q6).
When asked about a third-party owned PV system, 31% say the PV system "adds to value," 23% state it "neither adds to nor reduces value." On the other side, 13% state it reduces value and 33% were "not sure" (Appendix A – PV Value® Survey for Solar Industry Professionals Q7).

Ownership Transfer from Personal to Real Property – This question asks about whether they are aware if PV Value® was used to develop the fair market value (FMV) for an ownership transfer of the third-party owned PV system (Figure 12). Only 7% state they are aware it has been used for a FMV analysis, with 29% stating "no" and 64% saying they were not sure (Appendix A – PV Value® Survey for Solar Industry Professionals Q9).

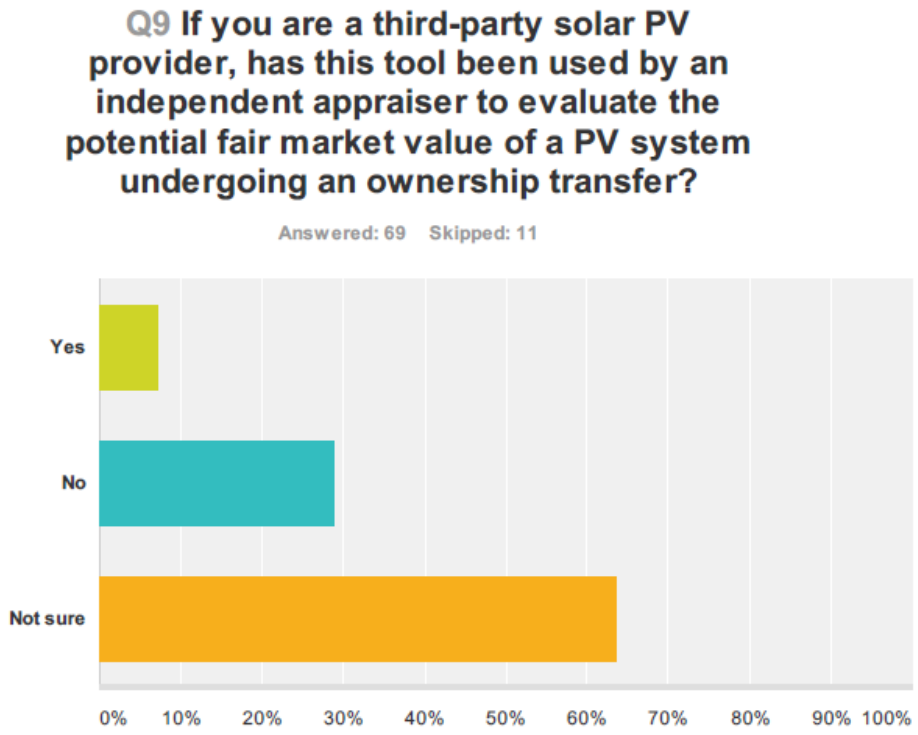

Figure 12. Awareness of Ownership Transfers for Third-Party Owned PV Systems

Quality Impacts on Value – When asked about "quality," 49% state that quality has "some impact" on value, and 45% say that quality has a "high impact" to value, whether market value or fair market value. Only 6% were not sure (Appendix A – PV Value® Survey for Solar Industry Professionals Q10).

User Interest and Satisfaction – In the "likely" category, 77% of respondents will use the web version of PV Value®. Only 7% of responses were in the "unlikely" category (Appendix A – PV Value® Survey for Solar Industry Professionals Q8).

PV Value® Web Analysis Products – A majority of responses by solar industry professionals (97%) state that having access to appraised values of PV systems would be "beneficial" (in varying degrees) to their business (Appendix A – PV Value® Survey for Solar Industry Professionals Q11).

Improvement Requests – There were multiple requests for additional features in the web version, with a sampling shown here (Appendix A – PV Value® Survey for Solar Industry Professionals Q12).

- *Recognition of longer warranty and additional solar production associated with microinverters.*
- *Make production model more transparent and allow for different investor models.*
- *Ability to interface with existing assessed and resale property transaction data sets. A feature that qualifies that data – market valuation, sales transaction, assessed value with dates those valuations were recorded.*
- *Map showing regional averages.*
- *Proof of appraisers adopting it for use.*
- *Access to compiled (anonymous) data on appraised values of PV systems.*
- *Better correlation to actual market value.*
- *A more up-to-date database of utility electric rates.*

3.3.8 Homeowners

The questions as presented in Table 9 are discussed below and grouped according to the "Question Type" column with summarized results. Appendix A has a detailed summary of each individual question collected from the survey tool.

Markets where Homes with PV are being Bought and Sold – The top 5 locations of the 67 survey participants from highest to lowest were in the following states: California, Arizona, New Mexico, Colorado and Texas (Appendix A – PV Value® Survey for Homeowners Q1).

General Feedback – Generally, homeowners are interested in knowing what the value of the PV system may be when they purchase it; or when they sell their home, what contributory value may come from the PV system. Some comments are presented below (Appendix A – PV Value® Survey for Homeowners Q2):

- *I am interested in purchasing from SunRun at fair market value after five years per my contract. I want to expand my system to cover my electric car I purchased recently. I need to own the system in order to do that.*
- *I am interested in purchasing a PV system, but since I will probably sell my home within the next 3-5 years, was concerned about the value added by the PV system to the overall resale value of my home. Although the tool appears to be very useful, it is not used by appraisers in my area. In my area, they typically increase the appraised value of a home by at most $5,000 for an owner owned PV system. In addition, a leased solar system is currently creating difficulties and delays in home sale escrows. For these reasons, I have reluctantly chosen to not install a PV system.*

Adoption of Solar PV – For homeowners that took the survey, 73% said they currently owned a PV system, and 27% said they did not. Those that owned a PV system, primarily stated that it was customer owned (85%) with 11% stating it was third-party owned and 4% were not sure (Appendix A – PV Value® Survey for Homeowners Q3, Q4).

For those that had not currently adopted solar PV, 52% planned to purchase a PV system, 5% planned to lease a PV system and 43% were not sure (Appendix A – PV Value® Survey for Homeowners Q5).

Ownership Option & Structure – For those that owned the PV system, the majority paid cash (55%), with the rest financed with home equity (14%), bank financing (7%), credit union (4%), and 2% not sure. No-one stated they will use a PACE assessment (Appendix A – PV Value® Survey for Homeowners Q6).

For those that chose third-party ownership, the monthly lease represented 57%, followed by PPAs at 28% and pre-paid leases at 14% (Appendix A – PV Value® Survey for Homeowners Q7).

Value Perception of Ownership Option – For homeowners that own their PV system, a majority of responses (91%) believe it does add value, with 9% stating they are "not sure." For those that are in third-party ownership agreements, 80% believe the PV system "adds to value" with 10% saying it "reduces value" and 10% stating they are "not sure" (Appendix A – PV Value® Survey for Homeowners Q8, Q9).

Exercise Buyout of Lease or PPA – For homeowners that have a buyout clause in their lease or PPA, 25% say they plan to buy it out, 25% say they won't buy it out and 50% state they are "not sure." A follow-on question about whether the PV system adds more value during the lease/PPA period or after it is purchased elicited responses of 44% stating that it has "more value when owned," 39% stating they are "not sure," 13% believe the "same value regardless of ownership" and 4% stating it has "more value when leased" (Appendix A – PV Value® Survey for Homeowners Q10, Q11).

Data Capturing and Entry – When asked about having a real estate agent use PV Value® when developing a market analysis for a home, 58% said "no," 35% said "yes," and 7% stated they were not sure (Figure 13). A similar spread of results came from a question on giving PV

Value® to an appraiser when appraising the home. 60% said "no," 37% said "yes," and 3% were "not sure" (Appendix A – PV Value® Survey for Homeowners Q12, Q13).

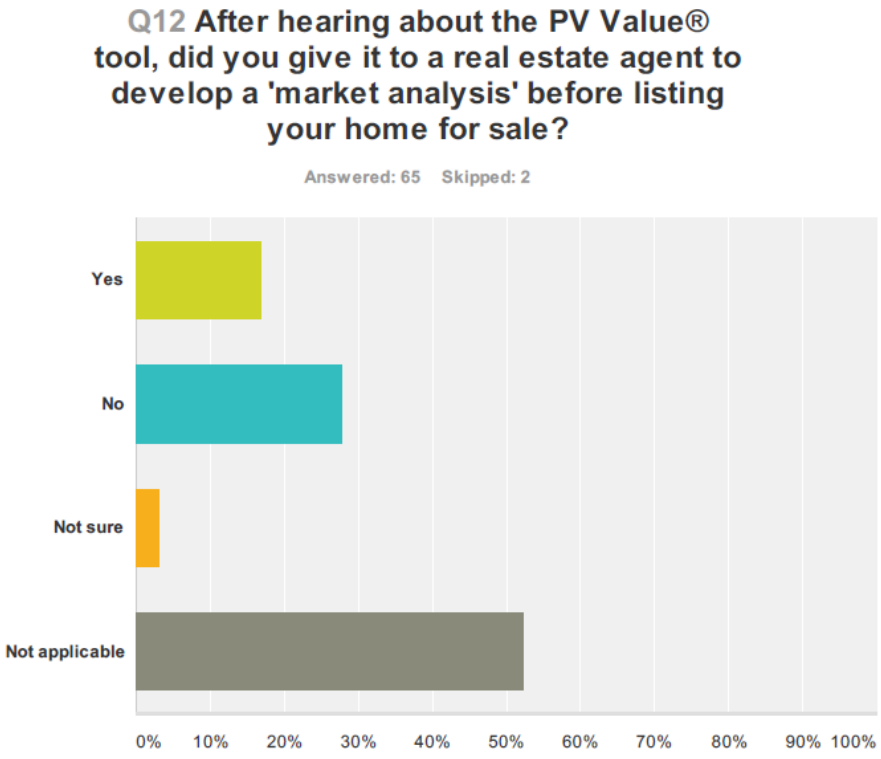

Figure 13. Use of PV Value® to Help Develop Listing Price

Size and Value Comparisons – This question surveyed the different results of PV system sizes and values that were given. Not knowing the age of the system or different market the system is in, a comparison can't be made, however the results are interesting as they shed some light on the values that homeowners have been receiving from appraisers. See Appendix A – PV Value® Survey for Homeowners (Q14) for specific responses.

User Interest and Satisfaction – Overall, most homeowners are would continue to use PV Value® when it moves to a web-based platform, with only 4% stating they would be unlikely to use it (Appendix A – PV Value® Survey for Homeowners Q15).

Improvement Requests – Generally, the improvement requests ranged from making the tool easier to use, and making it more available outside of a spreadsheet version. Other answers are presented below (Appendix A – PV Value® Survey for Homeowners Q16):

- *Including an option to include RECs within the tool or other incentives.*
- *Educate home appraisers on how to use it.*
- *More options for system configurations.*

4. CONCLUSIONS

This survey has provided a better understanding of the motivations behind each of the eight user classes that utilized the spreadsheet version of PV Value® between 2012 and 2014. As the tool is intended primarily for real property appraisers, the questions were focused on their experience using the tool to develop the value of photovoltaic systems in their marketplace. However, the responses by the other users are also relevant, as each stakeholder has an important role to play in creating, assessing and reflecting on marketplace demand for PV in the home sale process. This is measured through market response in terms of property price listing (including PV), and most importantly, its final selling price.

One of the most important results revealed in this survey is the fact that Residential Appraisers using PV Value® received positive feedback that their appraisal using PV Value® is being accepted (Section 3.1.1 and 3.3.1). This was an area of concern, as appraisers need to be educated on the tools they are using and prove competency before accepting the assignment. The fact that many appraisals were accepted suggests that the appraisers using PV Value® are taking the time to learn about how to properly use the tool and develop support for their choice of input values. New education materials are being developed in response to the demand by appraisers for relevant tools and a description on how to use those tools (Adomatis, 2014). The training and educational materials that are currently available to appraisers include the Residential and Commercial Valuation of Solar course (offered by the Appraisal Institute) which has over 200 pages of material to supplement a two-day course. Many of the individuals who have downloaded PV Value® and participants in the survey have taken this course. However, more appraisers need to be educated on these valuation techniques to ensure they have the required competency to value a PV system when encountered in their market.

The uncertainty over valuing TPO PV systems, primarily in the residential market, will play out over time as rules from organizations like HUD (FHA), FHFA (Fannie Mae and Freddie Mac) and the VA explicitly address how to treat the personal property aspects of leased and PPA PV systems. As a home with a PV system will typically save a consumer on their electricity bill, it may be more attractive than a property without a PV system and demand a higher premium regardless of who owns that PV system; however current studies at the time of this publication have only measured how "owned" PV systems add value, while it is unclear if TPO systems have a positive or negative impact on value. Future studies would need to address that discrepancy and reduce the uncertainty for all stakeholders involved in a real estate transaction.

It is worth noting that many improvements suggested are being developed to improve the tool and provide greater education on the inputs used in the tool. This includes improved help menus in the web version, a paper on how to develop discount rates for valuing PV systems, help topics specified for valuing RECs, SRECs and PBIs, and a database of PV systems with estimates of value for those PV systems. Other suggestions by the survey participants that are being considered include more local information on utility rates, local and recent PV installation costs, integration with the AI Green Addendum, exporting capabilities for written reports, better O&M cost estimates, recognition of different inverter warranty periods, as well as many others.

As the PV Value® tool is fully transitioned to the web version at the end of August 2014, it is expected that many users will continue to utilize it for developing the value of a PV system. Over time, as more stakeholders utilize the PV Value® tool and more advanced features are available, including a database of properties with PV systems that can be used for comparable sales analysis and developing fair market value, there will be opportunities to continue to measure its impact on the marketplace when used to facilitate real estate transactions with accompanying PV systems. The next generation of the tool has the potential to simply the PV valuation process even further through the creation of valuation models that can develop the market or fair market value of a PV system much in the same way new and used cars are valued in the marketplace.

Additional surveys should be implemented as necessary for users of the PV Value® web tool to continually gauge the successes and challenges faced when valuing a PV system. As improvements can always be made, these surveys will provide a good high-level view of what is working across different user classes, and provide a view of PV market adoption from the lens of real estate transactions and insight into regional challenges and success that will be easier to measure as PV Value® becomes a widely-used valuation platform.

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APPENDIX A: RAW SURVEY RESULTS

Q1 In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)

Answered: 89 Skipped: 0

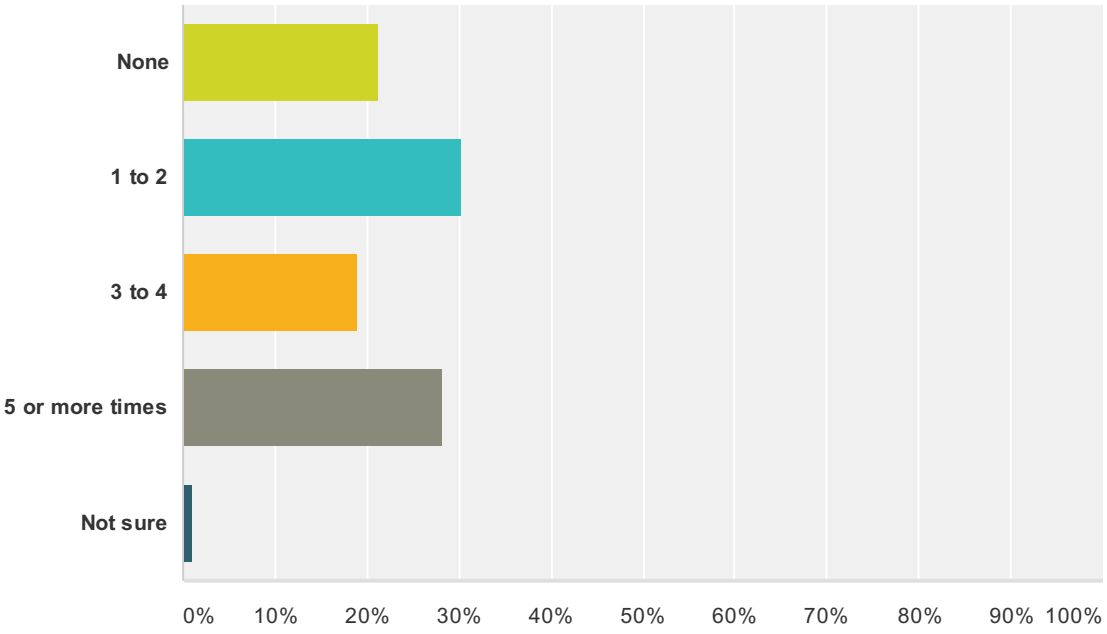
#	Responses	Date
1	81601	5/25/2014 8:49 PM
2	53705	5/16/2014 8:40 AM
3	22301	5/15/2014 8:53 AM
4	00912	5/15/2014 8:00 AM
5	85284	5/14/2014 9:21 PM
6	80129	5/14/2014 5:02 PM
7	31406	5/14/2014 5:00 PM
8	87111	5/14/2014 4:34 PM
9	85308	5/14/2014 3:42 PM
10	87507	5/14/2014 11:33 AM
11	85260	5/14/2014 11:06 AM
12	85758	5/14/2014 10:26 AM
13	01301	5/14/2014 10:04 AM
14	52172	5/14/2014 10:03 AM
15	85255	5/14/2014 9:22 AM
16	95691	5/14/2014 9:14 AM
17	95023	5/14/2014 9:13 AM
18	85704	5/14/2014 9:10 AM
19	85340	5/5/2014 1:48 PM
20	96740	5/1/2014 3:14 PM
21	96821	5/1/2014 12:35 PM
22	05089	5/1/2014 6:56 AM
23	04103	4/29/2014 6:46 AM
24	95355	4/28/2014 4:06 PM
25	92503	4/28/2014 3:24 PM
26	87031	4/27/2014 7:11 PM
27	87114	4/27/2014 6:06 PM
28	86001	4/27/2014 4:52 PM
29	05465	4/27/2014 12:28 PM
30	87105	4/27/2014 11:32 AM
31	85140	4/26/2014 9:08 PM
32	95945	4/26/2014 8:50 AM
33	54025	4/25/2014 2:41 PM

34	87123	4/25/2014 2:25 PM
35	77379	4/25/2014 11:44 AM
36	98052	4/25/2014 10:33 AM
37	92122	4/25/2014 9:11 AM
38	98075	4/25/2014 9:07 AM
39	81132	4/25/2014 9:02 AM
40	08535	4/25/2014 8:47 AM
41	88012	4/25/2014 8:12 AM
42	64151	4/25/2014 7:48 AM
43	05443	4/25/2014 6:56 AM
44	14623	4/25/2014 6:33 AM
45	02360	4/25/2014 6:00 AM
46	85086	4/24/2014 9:25 PM
47	87111	4/24/2014 6:58 PM
48	47720	4/24/2014 6:17 PM
49	08094	4/24/2014 6:13 PM
50	89015	4/24/2014 5:58 PM
51	96793	4/24/2014 5:50 PM
52	07461	4/24/2014 5:14 PM
53	00622	4/24/2014 5:12 PM
54	92075	4/24/2014 5:05 PM
55	33619	4/24/2014 5:02 PM
56	92010	4/24/2014 5:01 PM
57	80016	4/24/2014 5:00 PM
58	85083	4/24/2014 4:57 PM
59	93314	4/24/2014 4:56 PM
60	94705	4/24/2014 4:54 PM
61	96825	4/24/2014 4:53 PM
62	01985	4/23/2014 1:31 PM
63	95129	4/21/2014 10:25 PM
64	85210	4/21/2014 1:06 PM
65	92057	4/16/2014 4:28 PM
66	93309	4/15/2014 4:01 PM
67	06896	4/15/2014 8:32 AM
68	95330	4/13/2014 6:49 PM
69	32712	4/13/2014 9:41 AM
70	85022	4/11/2014 11:28 AM
71	89135	4/11/2014 10:29 AM
72	87002	4/11/2014 7:12 AM
73	96816	4/10/2014 9:28 PM

74	88005	4/10/2014 6:44 PM
75	80012	4/10/2014 5:07 PM
76	85012	4/10/2014 3:45 PM
77	92660	4/10/2014 3:23 PM
78	90701	4/10/2014 3:05 PM
79	48116	4/10/2014 2:42 PM
80	80020	4/10/2014 2:15 PM
81	87144	4/10/2014 1:56 PM
82	64086	4/10/2014 1:44 PM
83	85310	4/10/2014 1:26 PM
84	55044	4/10/2014 1:21 PM
85	80501	4/10/2014 1:02 PM
86	85701	4/10/2014 12:45 PM
87	33950	4/10/2014 12:41 PM
88	93063	4/10/2014 12:35 PM
89	87144	4/10/2014 12:29 PM

Q2 How many times have you used the Photovoltaic (PV) Value® tool for a job assignment in the past year?

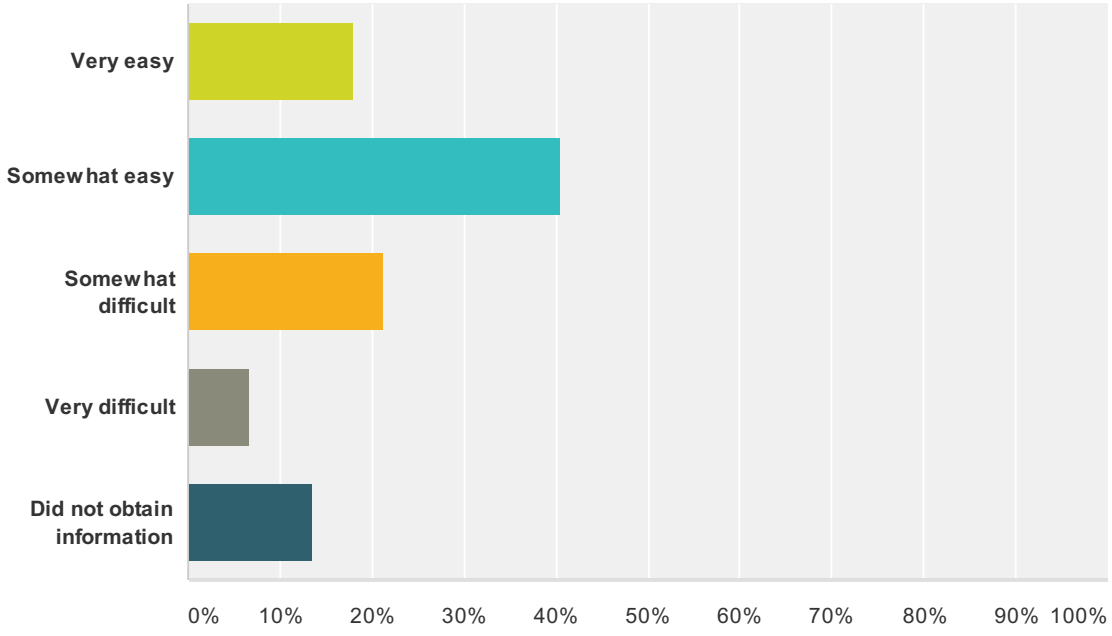
Answered: 89 Skipped: 0



Answer Choices	Responses	
None	**21.35%**	19
1 to 2	**30.34%**	27
3 to 4	**19.10%**	17
5 or more times	**28.09%**	25
Not sure	**1.12%**	1
Total		**89**

Q3 How easy was it to obtain PV system information from the homeowners?

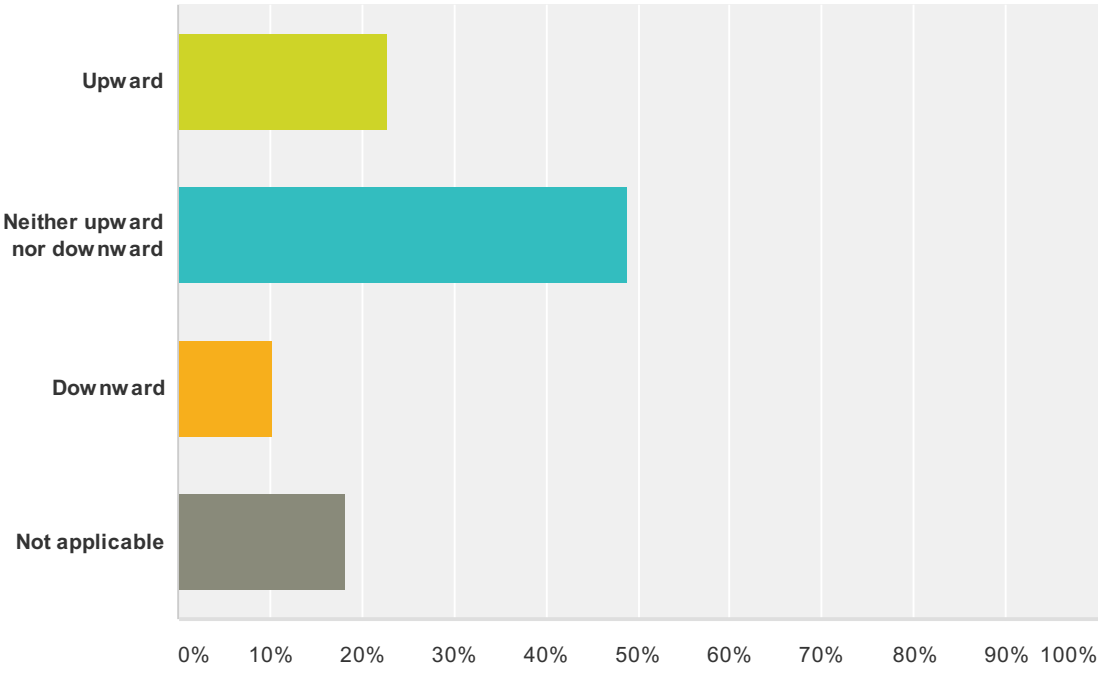
Answered: 89 Skipped: 0



Answer Choices	Responses	
Very easy	**17.98%**	16
Somewhat easy	**40.45%**	36
Somewhat difficult	**21.35%**	19
Very difficult	**6.74%**	6
Did not obtain information	**13.48%**	12
Total		**89**

Q4 Did you make adjustments upward or downward from the range of values provided by the tool?

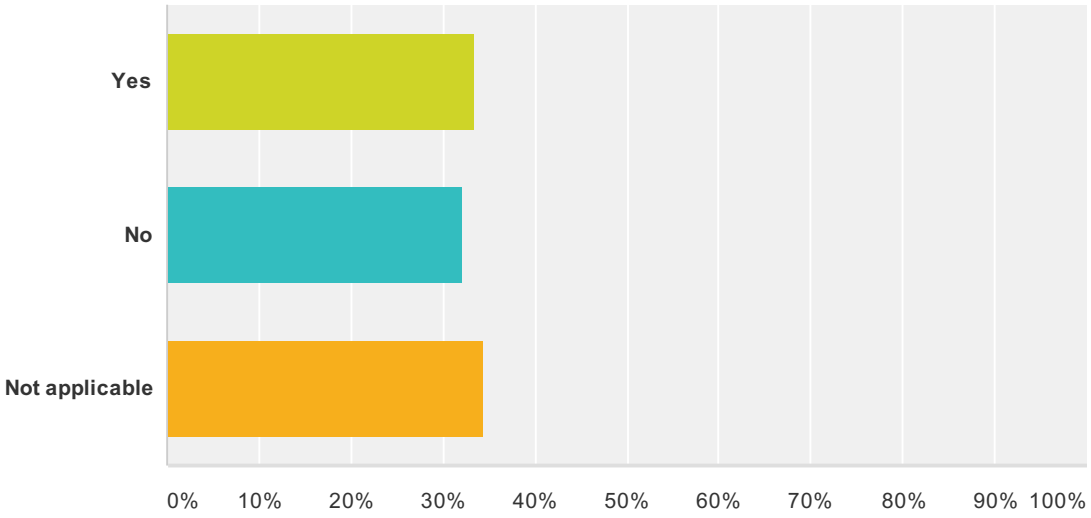
Answered: 88 Skipped: 1



Answer Choices	Responses	
Upward	**22.73%**	20
Neither upward nor downward	**48.86%**	43
Downward	**10.23%**	9
Not applicable	**18.18%**	16
Total		**88**

Q5 If PV system information was not available, were you still able to make an estimate using PV Value®?

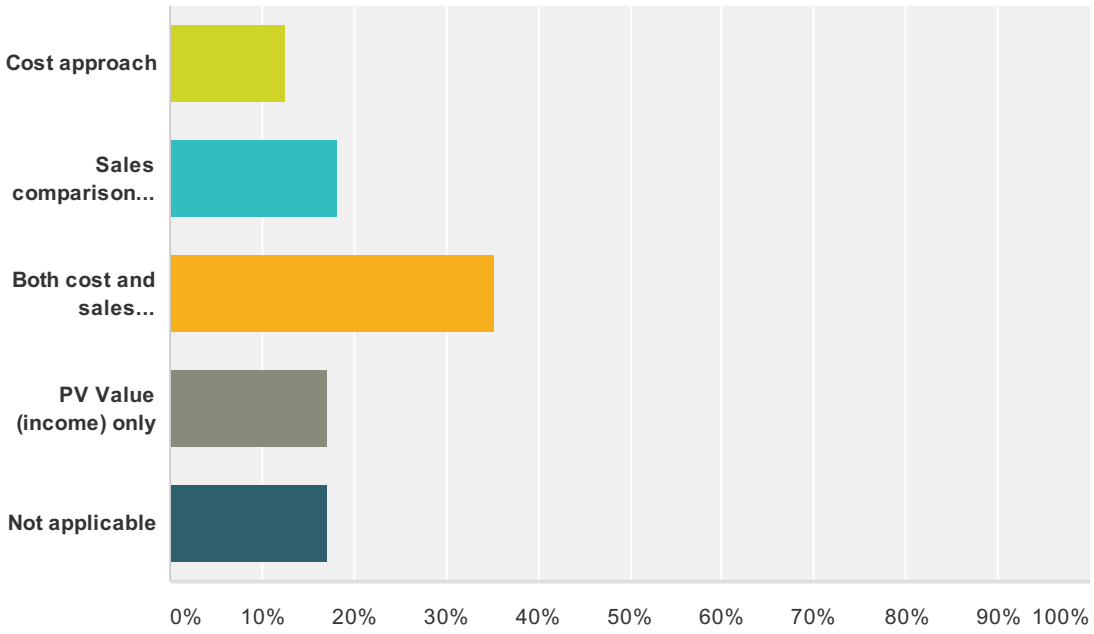
Answered: 87 Skipped: 2



Answer Choices	Responses	
Yes	**33.33%**	29
No	**32.18%**	28
Not applicable	**34.48%**	30
Total		**87**

Q6 In addition to using PV Value®, did you use the cost approach or sales comparison approach when developing a value conclusion?

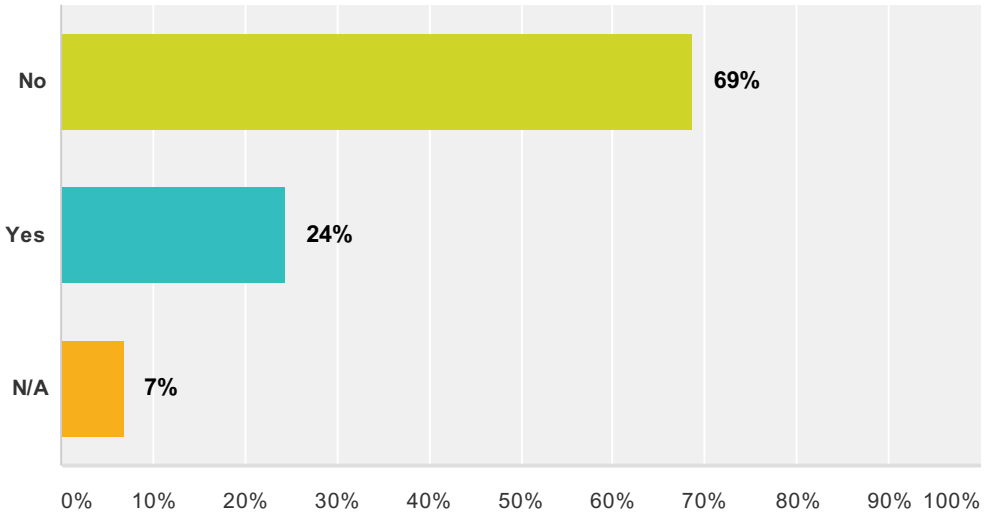
Answered: 88 Skipped: 1



Answer Choices	Responses	
Cost approach	**12.50%**	11
Sales comparison approach	**18.18%**	16
Both cost and sales comparison approaches	**35.23%**	31
PV Value (income) only	**17.05%**	15
Not applicable	**17.05%**	15
Total		**88**

Q7 In your market, are there enough comparable properties with PV systems to use a comparable sales approach?

Answered: 86 Skipped: 3



Answer Choices	Responses	
No	**69%**	59
Yes	**24%**	21
N/A	**7%**	6
Total		**86**

Q8 When you find comparable properties with PV, how do you use paired sales to develop the value?

Answered: 56 Skipped: 33

#	Responses	Date
1	Do not use paired sales; over 95% of our business is custom homes.	5/25/2014 8:49 PM
2	Try to get as much info about the comp's PV system - but agents are notoriously weak in this category.	5/15/2014 8:53 AM
3	not available in Puerto Rico	5/15/2014 8:00 AM
4	Very difficult to find comparable properties.	5/14/2014 9:21 PM
5	Still searching for a tool to do it. Would like to use your tool	5/14/2014 5:02 PM
6	Agent conversations first. Then typical paired sales to support a value difference.	5/14/2014 3:42 PM
7	Size of systems.	5/14/2014 11:33 AM
8	Combination with cost and income	5/14/2014 11:06 AM
9	as we normally do	5/14/2014 10:26 AM
10	no not enough data, no paired sales at this point	5/14/2014 10:04 AM
11	I run both through the valuation tool to determine differences. Market data is so limited, this is our best tool for valuation.	5/14/2014 10:03 AM
12	difficult ... but getting easier	5/14/2014 9:22 AM
13	Most realtors have no clue and don't publish data on solar. Just that it exists	5/14/2014 9:14 AM
14	Difficultly using paired sales as pertinent information such as ownership information was hard to get.	5/14/2014 9:13 AM
15	Really not enough data in the marketplace to do a paired sales approach. Usually other sales are too distant and too many other variables exist to do a good paired sales analysis, e.g., differences in sq ft, and other amenities, etc, etc	5/14/2014 9:10 AM
16	No, too many variables to support that. Oftern if a comparable property was found with solar, the issue is that you do not have the data of that solar system to arrive at any conclusion between the two	5/5/2014 1:48 PM
17	Applied in sales comparison	5/1/2014 3:14 PM
18	Paired sales in Hawaii are hard to do because we don't have cookie cutter homes all are unique and there are a lot of different ways solar/pv systems are being purchased so all of that has to be taken into consideration.	5/1/2014 12:35 PM
19	N/A	5/1/2014 6:56 AM
20	This is difficult in this area due to extreme property variance.	4/29/2014 6:46 AM
21	If not enough data in my county add surrounding counties with similar markets.	4/28/2014 4:06 PM
22	Unable to locate any other sales with PV	4/28/2014 3:24 PM
23	Very few sales thus far, but those I have seen provided erratic results.	4/27/2014 7:11 PM
24	As support to the PV value program. Was only able to do this once, pretty close in value.	4/27/2014 6:06 PM
25	To difficult to find sales with available data with PV systems.	4/27/2014 12:28 PM
26	Not paired sales--I make the argument that there is a real monthly savings and buyers will pay more for a home that costs less to operate.	4/27/2014 11:32 AM

27	Paired sales analysis results from finding several properties that area as similar as possible in the big value indicators but differ in the PV. Extract the similar items, any difference should be the value of the dissimilar contributor.	4/26/2014 9:08 PM
28	NO	4/26/2014 8:50 AM
29	ROI on time	4/25/2014 2:41 PM
30	Local NWMLS just added PV and solar in 2014 and tracking may become easier. Paired sales very few	4/25/2014 10:33 AM
31	I use all 3 methods if I have comparables. sc, cost and income	4/25/2014 9:11 AM
32	I attempt to find a similar property without PV for comparison. There is a lack of data available. Electric companies do not want to provide a list of homes with reverse meters installed, for example.	4/25/2014 9:02 AM
33	Typical	4/25/2014 8:12 AM
34	Only one second generation sale has been found. No apparent contribution	4/24/2014 6:58 PM
35	Haven't found any yet.	4/24/2014 6:17 PM
36	PAIRED SALES ANALYSIS, ADJUST ACCORDING TO AGE, SIZE, UPGRADES OF SYSTEM (SUCH AS IS IT HOOK UP TO THE GRID)	4/24/2014 5:58 PM
37	making assumptions about age of system	4/24/2014 5:05 PM
38	Not sure what you mean .... I don't find comps with PV.	4/24/2014 5:01 PM
39	I used paired analysis, I try find tract built homes of similar model/size, similar time frame of sale.	4/24/2014 4:57 PM
40	If available.	4/24/2014 4:56 PM
41	No. Not enough transactions.Not REAL WORLD.	4/24/2014 4:54 PM
42	It is usually difficult to find comparables similar to the subject in areas such as age, GLA, condition, etc that also have solar. However, several tract home builders are now selling homes with PV which makes it easier to find paired sales.	4/21/2014 1:06 PM
43	The problem is finding PV comparables. Although PV systems are common in my market, they are not a reported field in MLS. Furthermore, we need to know if they are owned or leased.	4/16/2014 4:28 PM
44	Yes	4/15/2014 4:01 PM
45	Based on kWh, age of system and home.	4/11/2014 11:28 AM
46	Not applicable yet as I have found few sales that mention the systems and there is no way to determine size other than to count panels. Ages are unknown etc.	4/10/2014 6:44 PM
47	YES	4/10/2014 5:07 PM
48	PV value is the best way to value solar. A recurring payment or recurring income needs to be capitalized to find value or have NPV computed on the revenue payment. Sales comparison on income producing properties is not reliable or appropriate.	4/10/2014 3:23 PM
49	Research the permit information. USUALLY I find it. If I dont, then I ask the agent what size the system was. Then I disclose what I CANT know about the system, estimate value based on my past experience.	4/10/2014 2:15 PM
50	Compare KW ratings to the subject and extract a value from non-PV similar comps.	4/10/2014 1:56 PM
51	Would if I could find them. I would still use the Photovoltaic (PV) Value® tool, which amounts to a version of the income approach.	4/10/2014 1:44 PM
52	The normal way	4/10/2014 1:26 PM
53	Typically adjust for everything else and then see what is evident.	4/10/2014 1:02 PM
54	substitution methodology	4/10/2014 12:45 PM
55	Always seek paired sales but not enough data yet to develop a credible value opinion.	4/10/2014 12:41 PM
56	I rely on the PV Value estimate of value for contributory value; paired set analysis has limited accuracy usually.	4/10/2014 12:29 PM

Q9 If using paired sales, where did you find the information about comparable PV systems, in terms of size, age, condition, etc.?

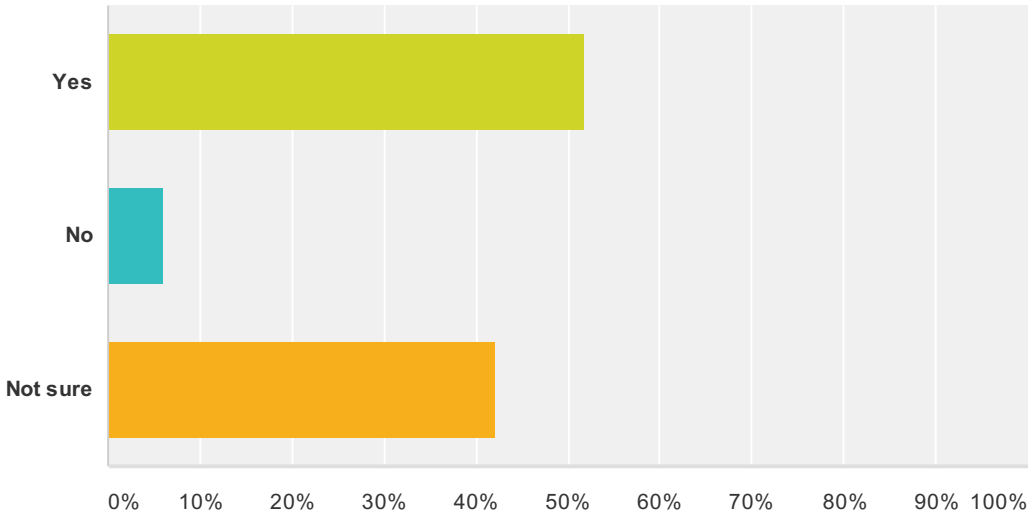
Answered: 54 Skipped: 35

#	Responses	Date
1	I can get data from the installation/selling PV dealer if it is one of the local companies.	5/25/2014 8:49 PM
2	I have to ask RE agents	5/15/2014 8:53 AM
3	same as question 8	5/15/2014 8:00 AM
4	NA	5/14/2014 9:21 PM
5	Still searching for a tool to do it. Would like to use your tool	5/14/2014 5:02 PM
6	Systems we have installed.	5/14/2014 5:00 PM
7	Agents where paossible. But overall that is too much fine tuning for a simplistic paired sale.	5/14/2014 3:42 PM
8	PV Value provided data	5/14/2014 11:33 AM
9	home owner	5/14/2014 11:06 AM
10	Limited info in MLS and limited info from realtor	5/14/2014 10:26 AM
11	So far market data has come from our own files regarding systems in the market	5/14/2014 10:04 AM
12	Call to builders	5/14/2014 10:03 AM
13	difficult ... but getting easier	5/14/2014 9:22 AM
14	The GSEs have not established a standard so I tend to diminish the value due to limited data and support.	5/14/2014 9:14 AM
15	N/A	5/14/2014 9:10 AM
16	Non	5/5/2014 1:48 PM
17	Usually seller or selling broker but information is sometimes problematic	5/1/2014 3:14 PM
18	Contractors, internet, RE agents for homes previously sold or active listings for exact information	5/1/2014 12:35 PM
19	N/A	5/1/2014 6:56 AM
20	Capacity and other details of the sales PV systems is typically unknown. Realtors rarely get this information from the owner of their listing.	4/29/2014 6:46 AM
21	Most of the time it is an estimate or unfortunately have to depend on listing agent comments.	4/28/2014 4:06 PM
22	N/A	4/28/2014 3:24 PM
23	Agent	4/27/2014 7:11 PM
24	MLS, calling the listing realtor who actually had the info on the paired sale PV system, amazingly.	4/27/2014 6:06 PM
25	Tried to call owners.	4/27/2014 12:28 PM
26	The problem with paired sales is that important data is missing: Kwh and what PNM is paying per Kw (varies according to contract)	4/27/2014 11:32 AM
27	Developers and builders, first, them installers and providers and finally by cold calling and knocking on doors (very painful!)	4/26/2014 9:08 PM
28	na	4/25/2014 10:33 AM
29	this info is usually not available	4/25/2014 9:11 AM

30	Local MLS and appraiser files from previous assignments.	4/25/2014 9:02 AM
31	MLS, agent	4/25/2014 8:12 AM
32	N/A	4/24/2014 6:58 PM
33	N/a	4/24/2014 6:17 PM
34	They were all over the place. Use sales where systems were found to illustrate that it did make a difference but did not have local data.	4/24/2014 6:13 PM
35	CALLED REALTOR AND INSTALLERS	4/24/2014 5:58 PM
36	n/a	4/24/2014 5:05 PM
37	That is information is not detailed enough. Agents typically report the existence of a PV system, not how big, age, conditon, etc.	4/24/2014 5:01 PM
38	MLS	4/24/2014 4:57 PM
39	MIs	4/24/2014 4:56 PM
40	Paired Sales is was of time. NOT REALITY	4/24/2014 4:54 PM
41	Agent or builder	4/21/2014 1:06 PM
42	N/A	4/16/2014 4:28 PM
43	Couldn't - estimated.	4/15/2014 4:01 PM
44	Agents and owners	4/11/2014 11:28 AM
45	See answer above.	4/10/2014 6:44 PM
46	COUNTED PANELS ON ROOF	4/10/2014 5:07 PM
47	I would never use the sale approach because properties are different, I use only the income approach	4/10/2014 3:23 PM
48	Major searching. If its not retained in the permit, then its very hard to find at all.	4/10/2014 2:15 PM
49	N/A	4/10/2014 1:44 PM
50	Counting Panels	4/10/2014 1:26 PM
51	Green Addendum from the Realtor or Broker	4/10/2014 1:02 PM
52	agent	4/10/2014 12:45 PM
53	That is difficult and one of the reasons it is next to impossible to pair sales.	4/10/2014 12:41 PM
54	I include a comp with a PV system to please underwriters but the property is rarely comparable. i rely on the PV Value indication of value for the system and adjust comps accordingly if they have no system which is usually the case.	4/10/2014 12:29 PM

Q10 Did the loan underwriter accept the valuation when submitting an assignment where the PV system was valued using PV Value®?

Answered: 83 Skipped: 6



Answer Choices	Responses	
Yes	**51.81%**	43
No	**6.02%**	5
Not sure	**42.17%**	35
Total		**83**

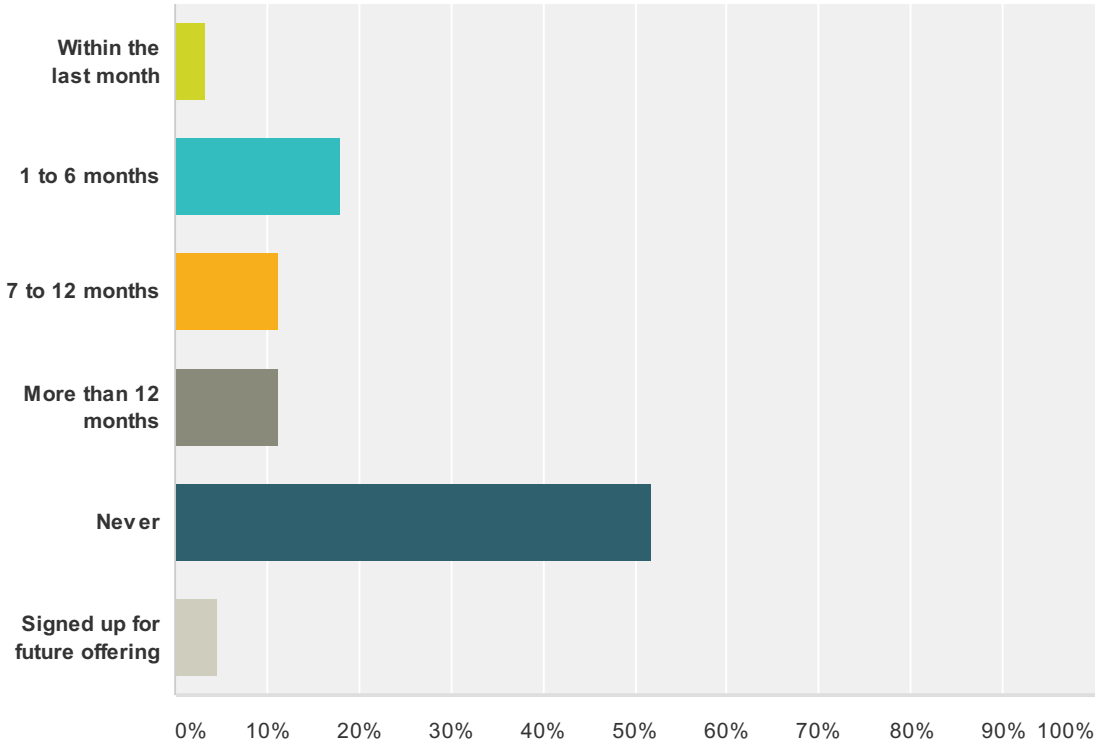
Q11 If the valuation was not accepted, what reason(s) did the underwriter give?

Answered: 19 Skipped: 70

#	Responses	Date
1	N/A	5/25/2014 8:49 PM
2	no comment	5/15/2014 8:00 AM
3	NA	5/14/2014 9:21 PM
4	Did not have any comps in the area where we have solar	5/14/2014 5:02 PM
5	have used in valuation at this time.	5/14/2014 11:33 AM
6	na	5/14/2014 10:04 AM
7	N/A	5/14/2014 9:10 AM
8	no response yet	5/1/2014 6:56 AM
9	Unknown	4/29/2014 6:46 AM
10	I've done maybe 10-12 homes with photovoltaics--never had a non-acceptance of my analysis.	4/27/2014 11:32 AM
11	The 2 I did went through but applying a reasonable man approach, the contribution verses cost were not big wave makers, or the underwriter didn't know enough to question the adjustment or technique	4/26/2014 9:08 PM
12	Gave lower value	4/25/2014 6:00 AM
13	N/A	4/24/2014 5:58 PM
14	N/A	4/24/2014 4:54 PM
15	Never have heard from an UW	4/21/2014 1:06 PM
16	ignorance and lack of understanding, unwillingness to change	4/10/2014 3:23 PM
17	N/A	4/10/2014 1:44 PM
18	The market is not reciprocation an adjustment at this time with residential properties. People want solar, but dont want to pay for it. At this time is really seems more of a fashion statement and the typical buyer is not giving them additional value considerations.	4/10/2014 12:45 PM
19	n/a	4/10/2014 12:41 PM

Q12 How recently have you taken a course on appraising solar PV systems?

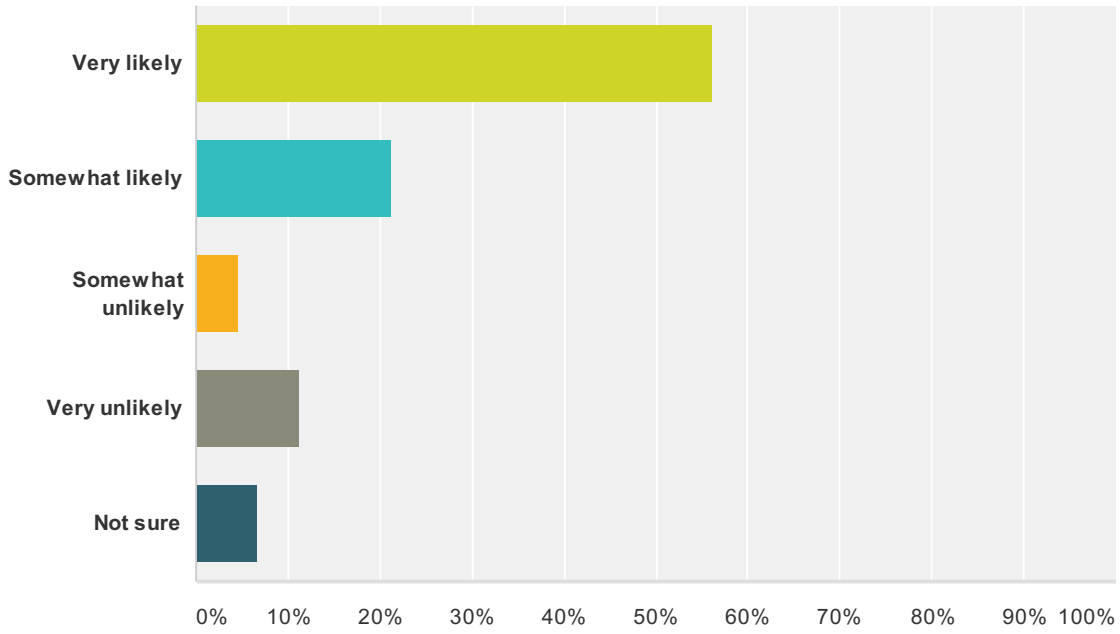
Answered: 89 Skipped: 0



Answer Choices	Responses	
Within the last month	**3.37%**	3
1 to 6 months	**17.98%**	16
7 to 12 months	**11.24%**	10
More than 12 months	**11.24%**	10
Never	**51.69%**	46
Signed up for future offering	**4.49%**	4
Total		**89**

Q13 How likely would you be to take an online course in valuing PV systems if the course met state certification CE requirements?

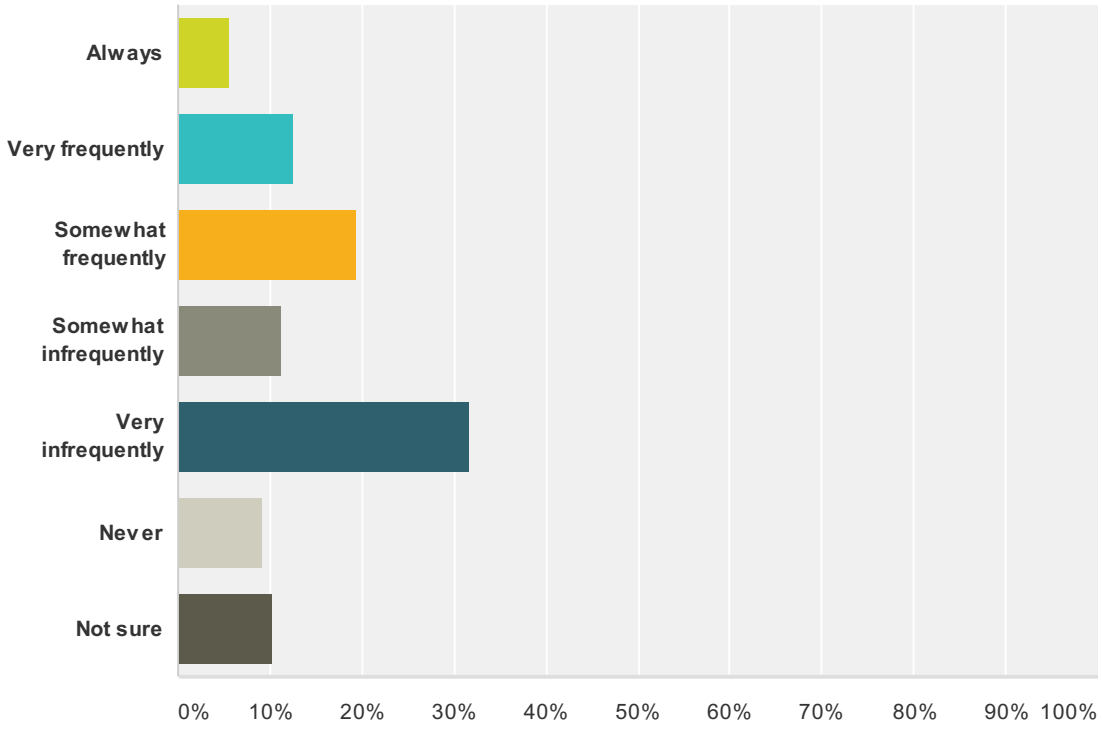
Answered: 89 Skipped: 0



Answer Choices	Responses	
Very likely	**56.18%**	50
Somewhat likely	**21.35%**	19
Somewhat unlikely	**4.49%**	4
Very unlikely	**11.24%**	10
Not sure	**6.74%**	6
Total		**89**

Q14 How frequently does the MLS in your area provide details about the presence of PV systems?

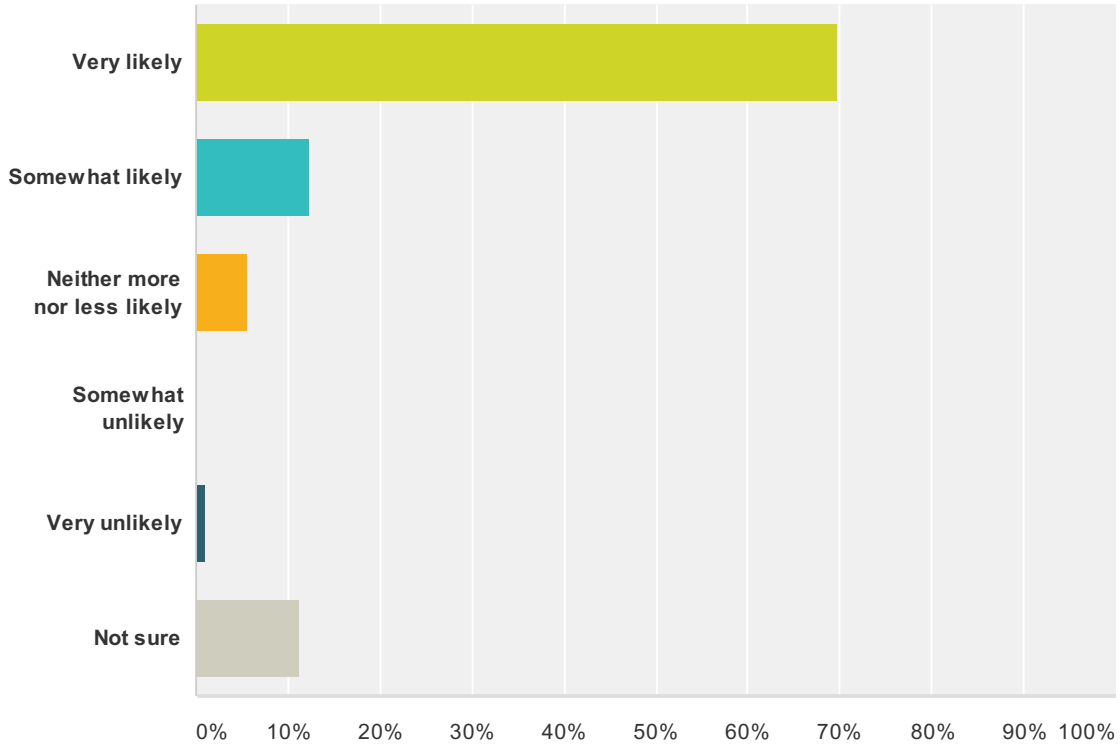
Answered: 88 Skipped: 1



Answer Choices	Responses	
Always	**5.68%**	5
Very frequently	**12.50%**	11
Somewhat frequently	**19.32%**	17
Somewhat infrequently	**11.36%**	10
Very infrequently	**31.82%**	28
Never	**9.09%**	8
Not sure	**10.23%**	9
Total		**88**

Q15 How likely are you to continue to use the PV Value® tool when it moves to a web-based platform?

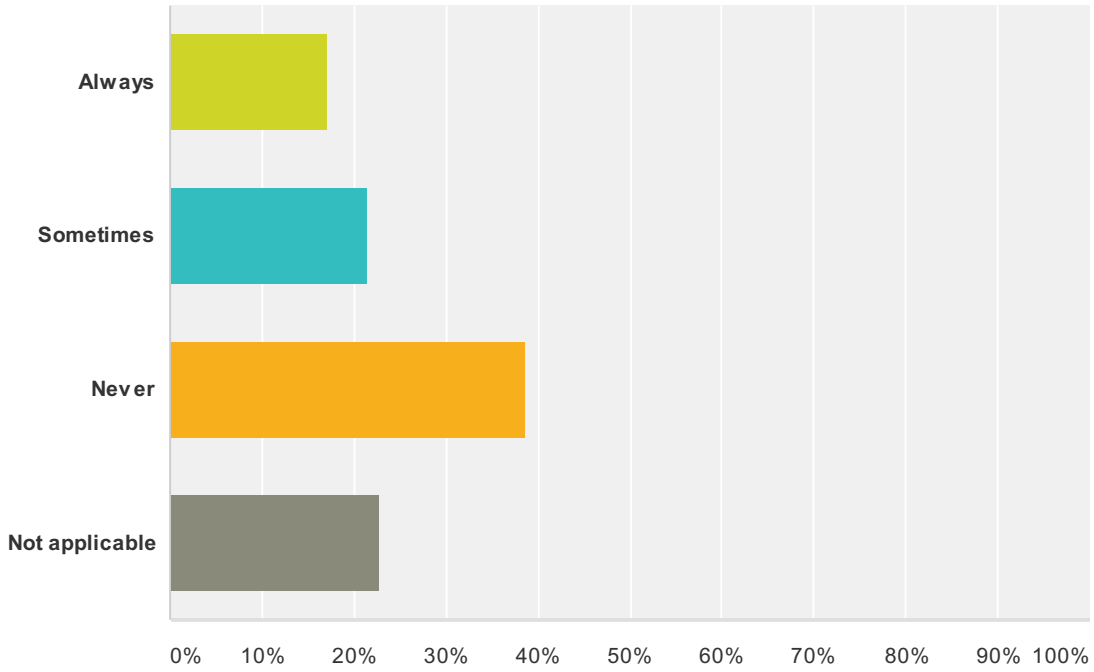
Answered: 89 Skipped: 0



Answer Choices	Responses	
Very likely	**69.66%**	62
Somewhat likely	**12.36%**	11
Neither more nor less likely	**5.62%**	5
Somewhat unlikely	**0.00%**	0
Very unlikely	**1.12%**	1
Not sure	**11.24%**	10
Total		**89**

Q16 To what extent do you enter PV system characteristics on Al Form 820.04 - Residential Green and Energy Efficient Addendum?

Answered: 88 Skipped: 1



Answer Choices	Responses	
Always	**17.05%**	15
Sometimes	**21.59%**	19
Never	**38.64%**	34
Not applicable	**22.73%**	20
Total		**88**

Q17 If you do not always, or never, enter PV system characteristics on AI Form 820.04 - Residential Green Energy Efficient Addendum, please explain why not.

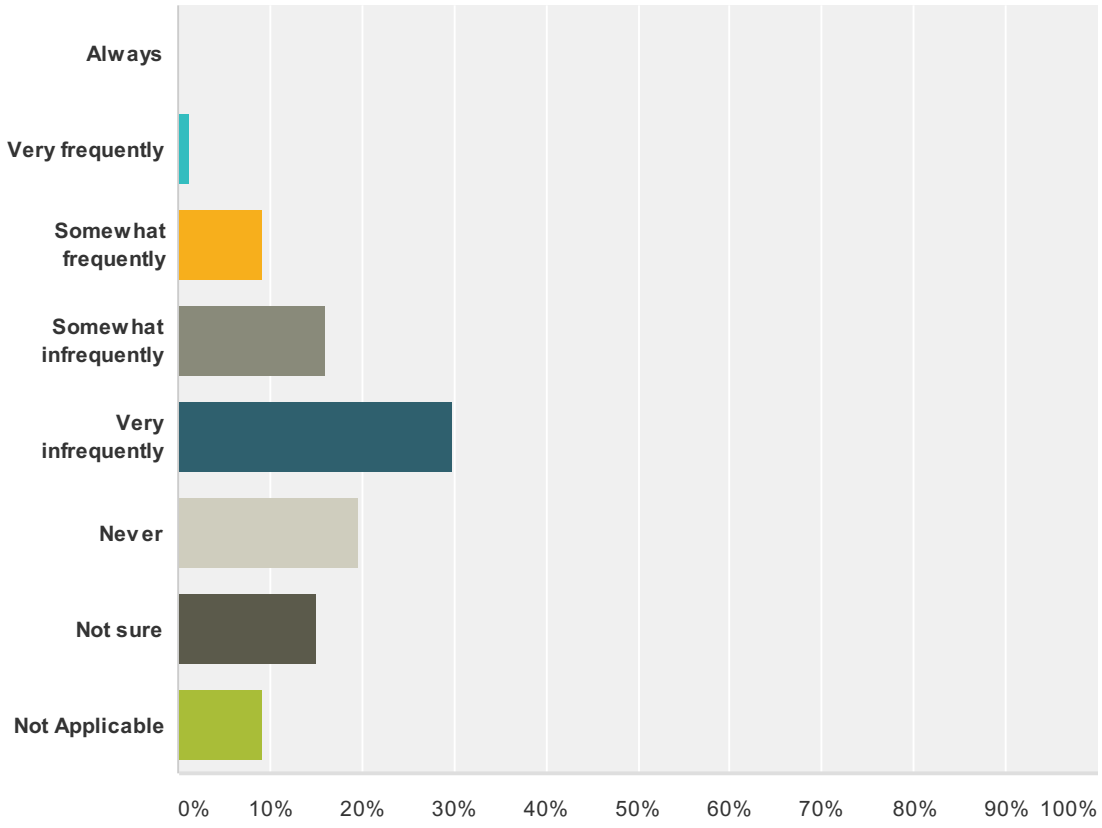
Answered: 41 Skipped: 48

#	Responses	Date
1	N/A	5/25/2014 8:49 PM
2	My assignments have been residential lending assignments. The fee for the assignment doesn't allow for me to spend the time, and I have the impression the bank wouldn't want the information. I'm not certain whether this form translates into AI ready.	5/15/2014 8:53 AM
3	not frequent in Puerto Rico	5/15/2014 8:00 AM
4	Not necessary or required.	5/14/2014 9:21 PM
5	Don't know what this form is or if Colorado uses this form	5/14/2014 5:02 PM
6	Not needed. I simply enter the figures in the grid of a 1004 as a line item	5/14/2014 4:34 PM
7	It is an un-necessary form. All the information is already in my addendum. The form is also not well know or well recognized in the lending market.	5/14/2014 3:42 PM
8	no available	5/14/2014 10:04 AM
9	Havent had the need. but probably will	5/14/2014 9:14 AM
10	Most of my clients (banks) are sketchy about valuation of PV systems.	5/14/2014 9:13 AM
11	Many times the homeowner does not remember the cost of the system, the Kw's, rebates, etc, etc. Very difficult obtaining information from homeowners and on new builds, builders are reluctant to share their cost information.	5/14/2014 9:10 AM
12	No	5/5/2014 1:48 PM
13	not required	5/1/2014 12:35 PM
14	systems are commercial	5/1/2014 6:56 AM
15	Lack of availability.	4/29/2014 6:46 AM
16	Very minimal activity with truly green dwellings at this time.	4/27/2014 7:11 PM
17	Underwriters do not require the form. I'm already inundated with unnecessary forms.	4/27/2014 6:06 PM
18	I have a lengthy write up of how photovoltaic works and how I arrived at a value. email me @ [redacted] and I'll send you my Word document	4/27/2014 11:32 AM
19	The form is too detailed to serve only a consideration of PV. There are multiple questions about green features that are not always available to the subject home.	4/26/2014 9:08 PM
20	depends upon the scope and the need really	4/25/2014 10:33 AM
21	My clients have not expressed a desire for the additional form; reports have already doubled or tripled in length in the past 10 years without adding another form. The data can be entered in existing forms.	4/25/2014 9:02 AM
22	Not familiar with it, nor have I needed to. I'm sure in future I will.	4/24/2014 6:17 PM
23	HAVE NOT USED FORM BEFORE	4/24/2014 5:58 PM
24	Do not know what this addendum is!	4/24/2014 5:02 PM
25	Didn't know it existed.	4/24/2014 5:01 PM
26	I did not know about it.	4/24/2014 5:00 PM

27	No client requirement	4/24/2014 4:57 PM
28	Lenders wont pay extra fee for this addendum.	4/24/2014 4:54 PM
29	Not a residential appraiser	4/23/2014 1:31 PM
30	Not required by lender	4/21/2014 1:06 PM
31	Have never been asked to. I usually insert the information and spreadsheet into my addendum.	4/16/2014 4:28 PM
32	Never. Form is too comprehensive for the reader to understand.	4/15/2014 4:01 PM
33	Not needed	4/13/2014 6:49 PM
34	Not required. Adds to chance of revisions. Also, no extra money for the extra work.	4/11/2014 11:28 AM
35	HAVE NOT USED THE FORM	4/10/2014 5:07 PM
36	Takes too long. I can write the data up in the appraisal itself much quicker. Also, underwriters have no idea what the information on the form means.	4/10/2014 2:15 PM
37	The form has too many fields that cannot be verified unless it is new construction.	4/10/2014 1:56 PM
38	many of the automated web plat forms for uploading appraisal reports do not allow that particular form to be attached to residential report. For example: www.appraisalport.com	4/10/2014 12:45 PM
39	n/a	4/10/2014 12:41 PM
40	I do not have time	4/10/2014 12:35 PM
41	not familiar with that form; I do provide what system details I can in the body of my report.	4/10/2014 12:29 PM

Q18 When you appraise properties with PV systems, how frequently are PV systems shaded, or structures present that could shade the systems at various times during the day?

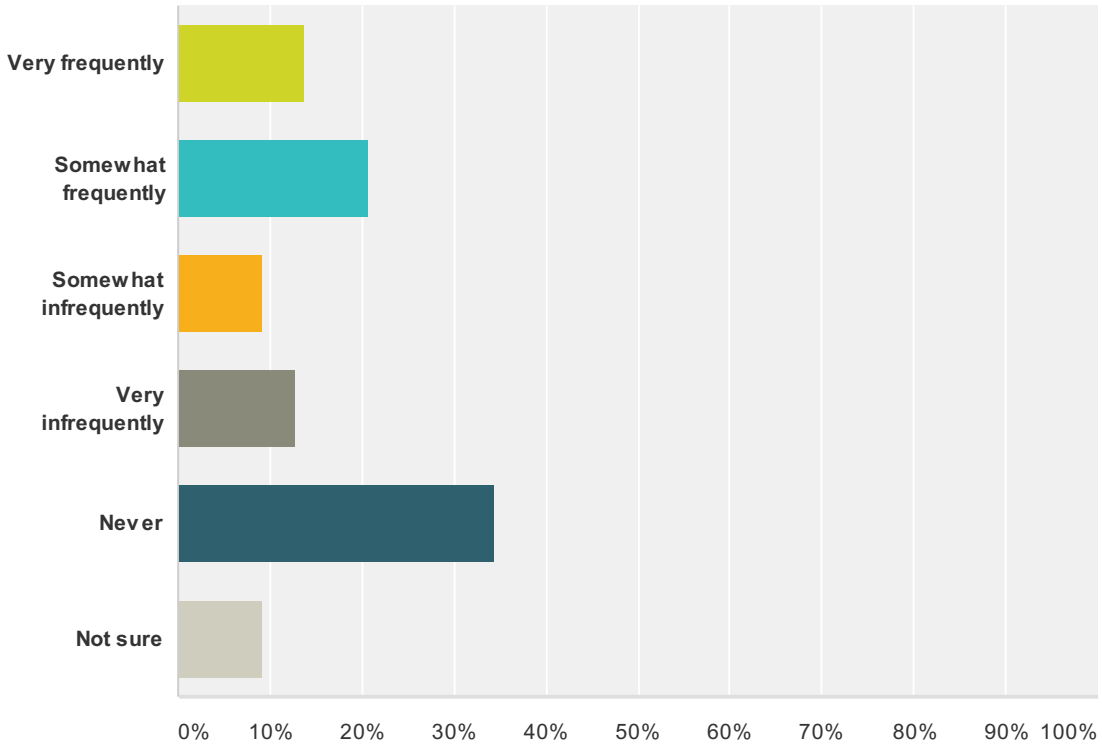
Answered: 87 Skipped: 2



Answer Choices	Responses	
Always	**0.00%**	0
Very frequently	**1.15%**	1
Somewhat frequently	**9.20%**	8
Somewhat infrequently	**16.09%**	14
Very infrequently	**29.89%**	26
Never	**19.54%**	17
Not sure	**14.94%**	13
Not Applicable	**9.20%**	8
Total		**87**

Q19 How frequently have you encountered third-party owned (leased or Power Purchase Agreement) PV systems when appraising a property?

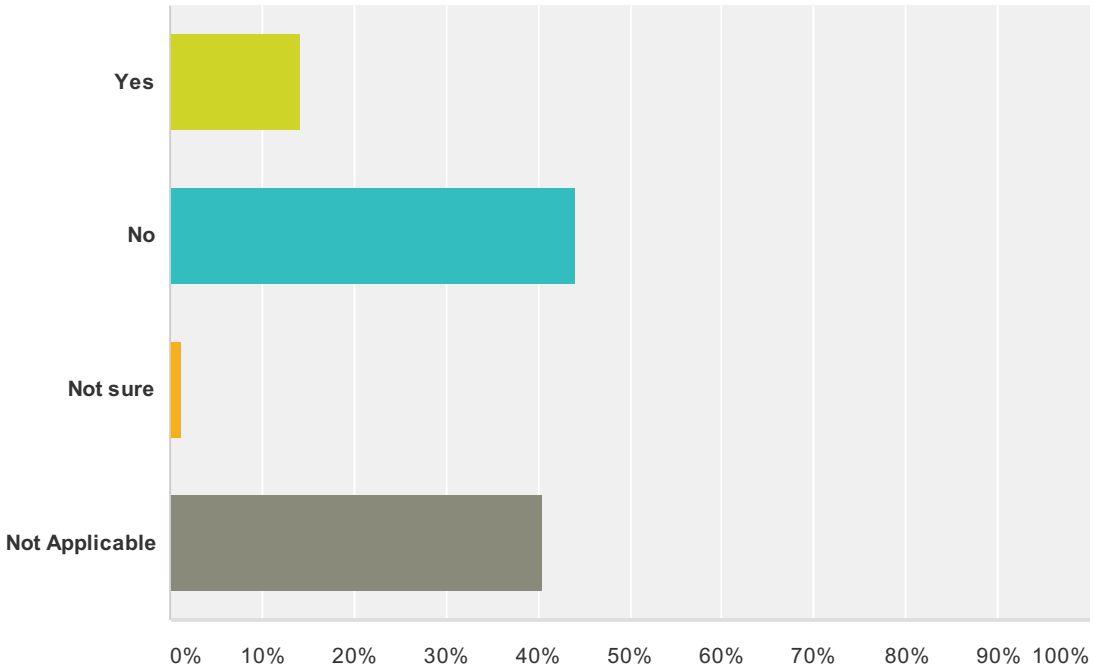
Answered: 87 Skipped: 2



Answer Choices	Responses	
Very frequently	**13.79%**	12
Somewhat frequently	**20.69%**	18
Somewhat infrequently	**9.20%**	8
Very infrequently	**12.64%**	11
Never	**34.48%**	30
Not sure	**9.20%**	8
Total		**87**

Q20 If you have encountered third-party owned (leased or Power Purchase Agreement) PV systems, did you assign a value to the system?

Answered: 84 Skipped: 5



Answer Choices	Responses	
Yes	**14.29%**	12
No	**44.05%**	37
Not sure	**1.19%**	1
Not Applicable	**40.48%**	34
Total		**84**

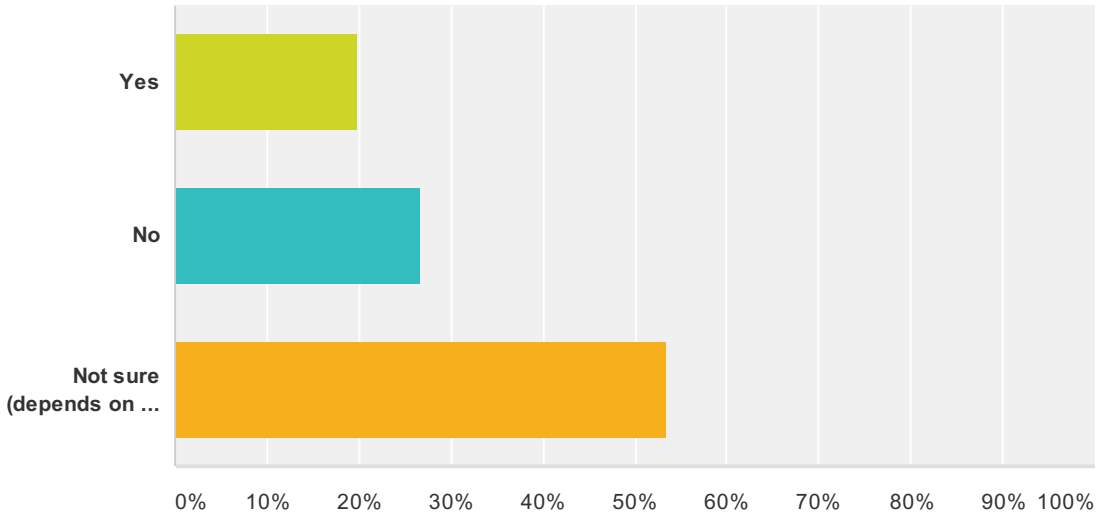
Q21 If "Yes," what methods did you use to assign a value to the PV system?

Answered: 21 Skipped: 68

#	Responses	Date
1	N/A	5/25/2014 8:49 PM
2	NA	5/14/2014 9:21 PM
3	Only if it is a pre-paid lease and fully assumable by future buyers.	5/14/2014 3:42 PM
4	If lease is paid in full then income for savings as an adjustment	5/14/2014 11:06 AM
5	income	5/14/2014 10:04 AM
6	N/A	5/14/2014 9:10 AM
7	N/A	5/5/2014 1:48 PM
8	PV spreadsheet	5/1/2014 6:56 AM
9	na	4/26/2014 9:08 PM
10	i always analyze for income approach	4/25/2014 9:11 AM
11	SAME, UTILIZING OTHER THIRD PARTY OWNED SYSTEMS	4/24/2014 5:58 PM
12	paired sales and new builder option cost	4/24/2014 5:05 PM
13	Used your lease option in the tool	4/24/2014 5:01 PM
14	extraction, also, MLS reflects owned or leased systems.	4/24/2014 4:57 PM
15	Discounted cash flow	4/23/2014 1:31 PM
16	Paired sales	4/11/2014 11:28 AM
17	If encountered I would not assign any value to the property being appraised unless the system reverted to the owner in less than 5 years and the warranty had over 5 years left on it.	4/10/2014 6:44 PM
18	net present value of savings or a capitalization rate applied to net operating income	4/10/2014 3:23 PM
19	N/A	4/10/2014 1:44 PM
20	The AI form is worthless to residential appraisers and a waste of time to complete.	4/10/2014 12:45 PM
21	n/a it is personal property if not owned by property owner	4/10/2014 12:41 PM

Q22 Would you consider a third-party owned (leased or Power Purchase Agreement) PV system in a comparable property analysis?

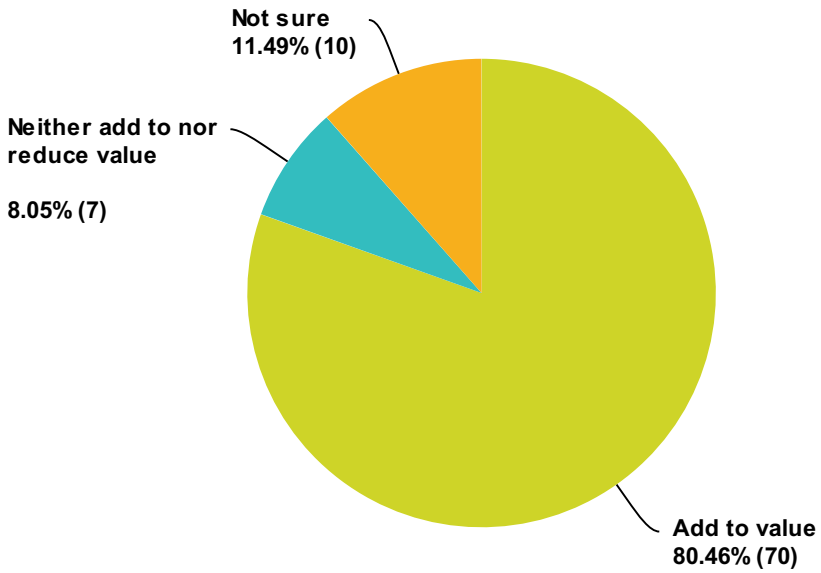
Answered: 86 Skipped: 3



Answer Choices	Responses	
Yes	**19.77%**	17
No	**26.74%**	23
Not sure (depends on the circumstance)	**53.49%**	46
Total		**86**

Q23 Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?

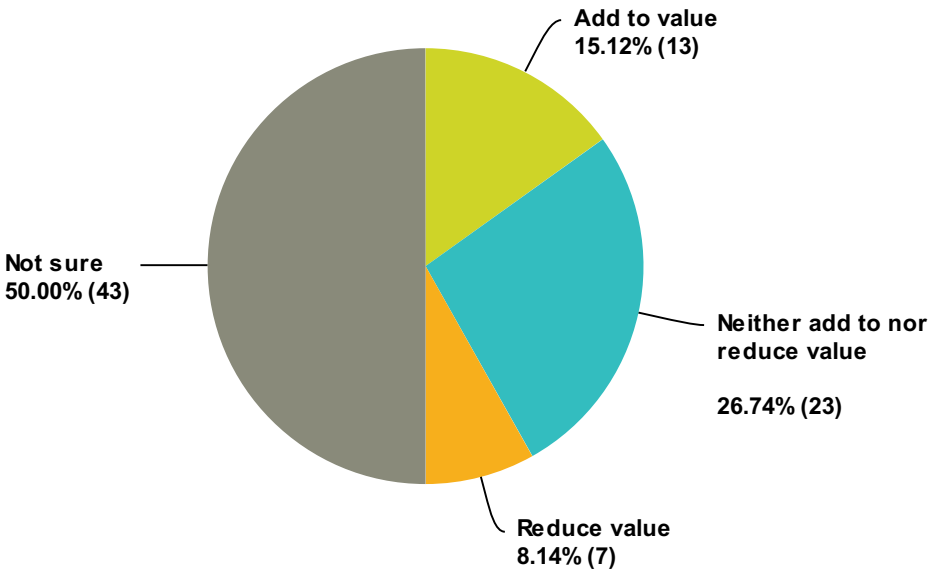
Answered: 87 Skipped: 2



Answer Choices	Responses	
Add to value	80.46%	70
Neither add to nor reduce value	8.05%	7
Reduce value	0.00%	0
Not sure	11.49%	10
Total		87

Q24 Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?

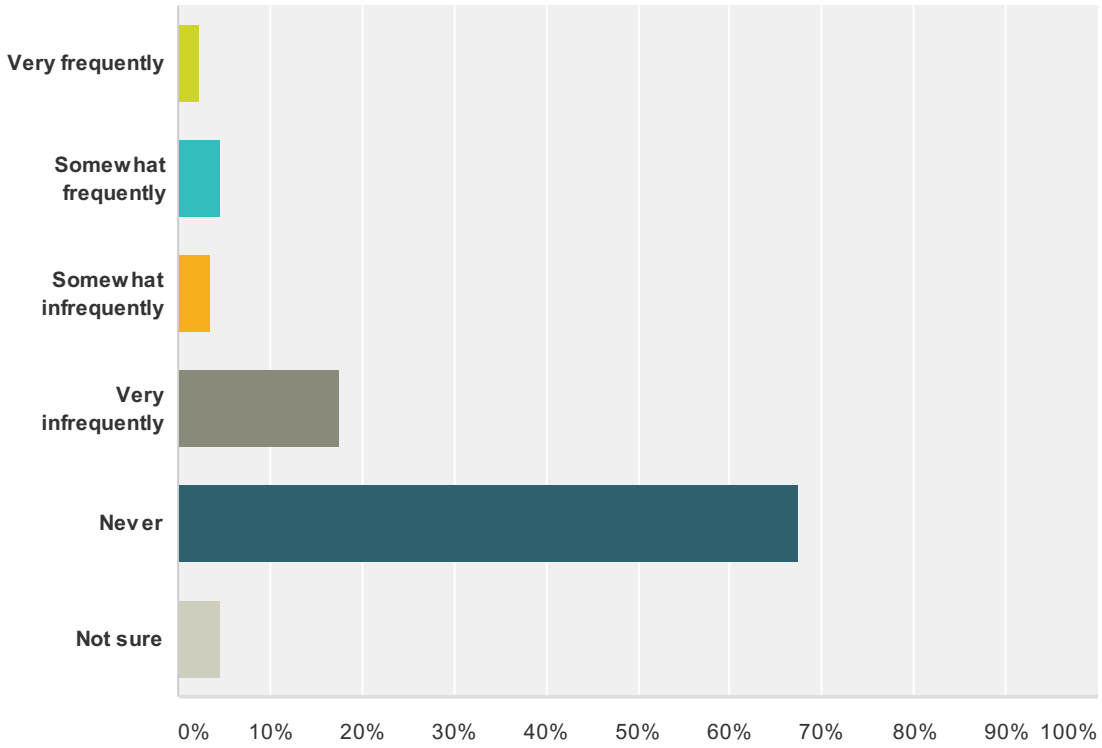
Answered: 86 Skipped: 3



Answer Choices	Responses	
Add to value	15.12%	13
Neither add to nor reduce value	26.74%	23
Reduce value	8.14%	7
Not sure	50.00%	43
Total		86

Q25 How frequently have you used PV Value® to develop the value of renewable energy credits (RECs or SRECs) or production based incentives (PBIs)?

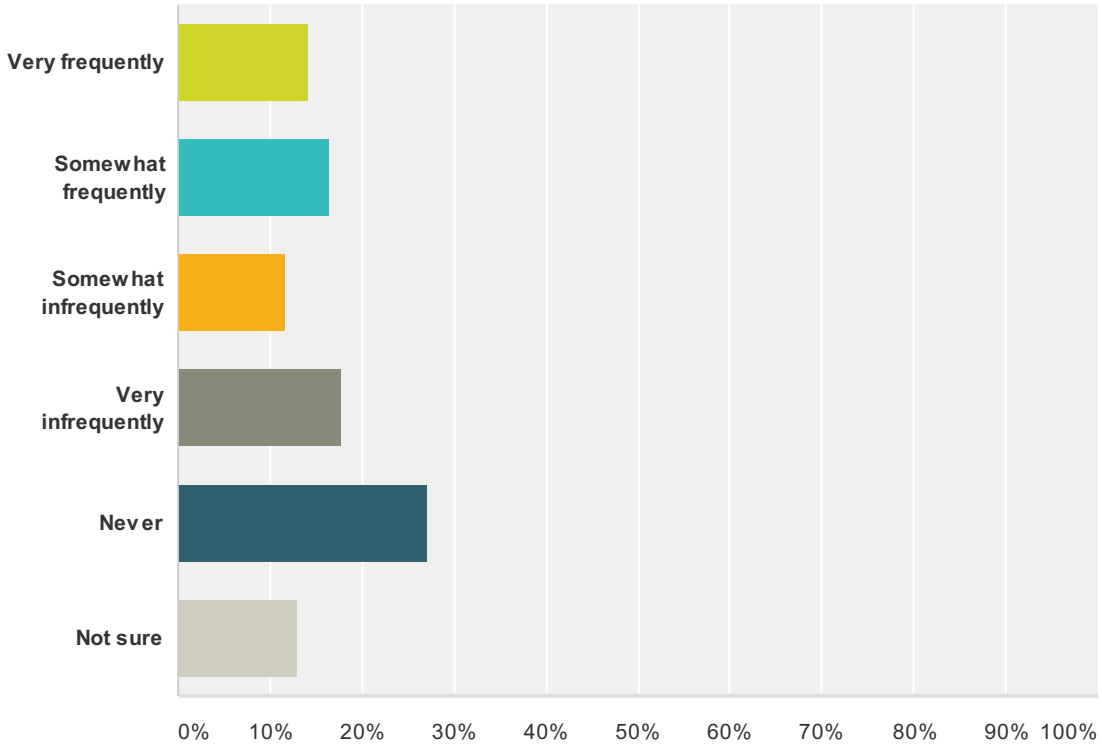
Answered: 86 Skipped: 3



Answer Choices	Responses	
Very frequently	**2.33%**	2
Somewhat frequently	**4.65%**	4
Somewhat infrequently	**3.49%**	3
Very infrequently	**17.44%**	15
Never	**67.44%**	58
Not sure	**4.65%**	4
Total		**86**

Q26 How frequently do you consider functional obsolescence when valuing a home with a PV system?

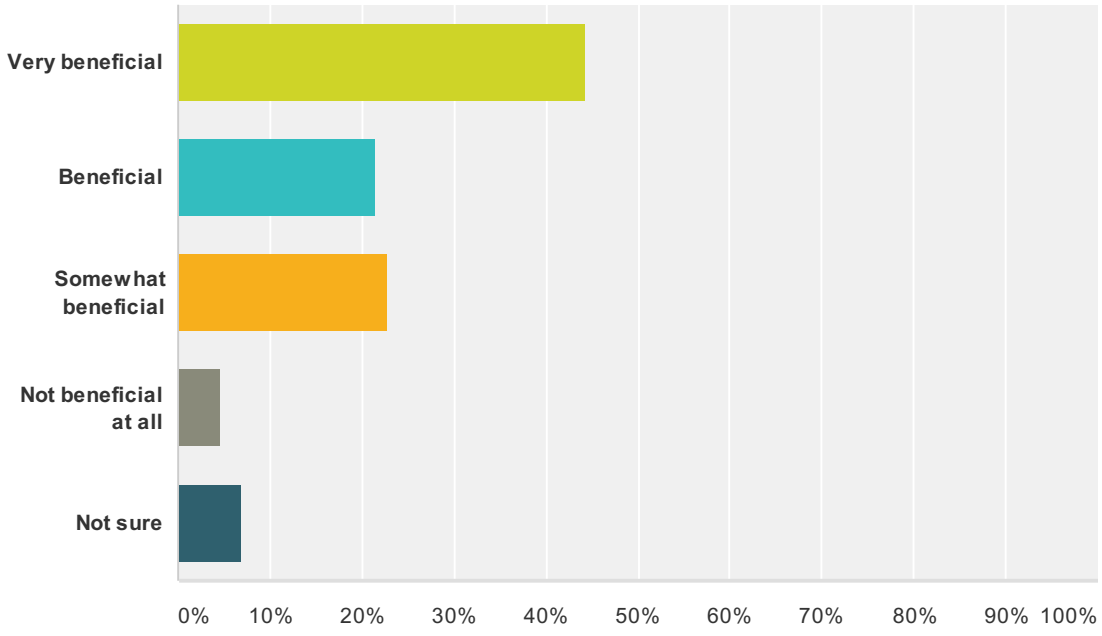
Answered: 85 Skipped: 4



Answer Choices	Responses	
Very frequently	**14.12%**	12
Somewhat frequently	**16.47%**	14
Somewhat infrequently	**11.76%**	10
Very infrequently	**17.65%**	15
Never	**27.06%**	23
Not sure	**12.94%**	11
Total		**85**

Q27 How beneficial would access to appraised values of PV systems in your market area be to your practice?

Answered: 88 Skipped: 1



Answer Choices	Responses	
Very beneficial	**44.32%**	39
Beneficial	**21.59%**	19
Somewhat beneficial	**22.73%**	20
Not beneficial at all	**4.55%**	4
Not sure	**6.82%**	6
Total		**88**

Q28 What would make the PV Value® tool more useful?

Answered: 40 Skipped: 49

#	Responses	Date
1	I think it is great the way it is!	5/25/2014 8:49 PM
2	no idea	5/15/2014 8:00 AM
3	Online training for CE credit	5/14/2014 9:21 PM
4	Don't know would like to see the Web version and use it	5/14/2014 5:02 PM
5	Easier access. It does not load on all my computers.	5/14/2014 3:42 PM
6	My issue is the cost depreciation in the first year. If there was a 40k system put on the home and it needed to be replaced 60 days later it is unlikely that home owner could get replacement costs. My only issue with the calculator is thre needs to be a way to do subject to appraisals where the value is more inline with the installation costs.	5/14/2014 11:06 AM
7	great tool	5/14/2014 10:04 AM
8	local data of kwh cost	5/14/2014 9:14 AM
9	??	5/14/2014 9:10 AM
10	IF it was able to provide data of what typical costs to install were/are.	5/5/2014 1:48 PM
11	The PV tool seems to estimate the present value of energy production ("income") over initial and operating cost. Is that correct? If so it is the incremental potential value to the owner but does not address how much a buyer would pay the buyer for the system which is the real value benefit to the owner.	5/1/2014 3:14 PM
12	the Value tool is fine the way it is.	5/1/2014 6:56 AM
13	Nothing	4/28/2014 4:06 PM
14	Haven't tried it in a while ---the old one 'expired' not easy to use and seemed to lock up...would be great if you'd create a youtube-type demo on using the thing	4/27/2014 11:32 AM
15	I am pleased so far, need more exposure.	4/26/2014 9:08 PM
16	haven't used it yet. plan on reviewing in the next couple of weeks.	4/25/2014 9:11 AM
17	Better MLS information from realtors, freely provided billing or type of installation information from power companies or some other source to compare actual savings. Home specific data on appliance efficiency, heat loss, passive solar effectiveness.	4/25/2014 9:02 AM
18	NOTE: AS A TOWN LISTER I DOWNLOADED THIS TOOL TO ASSIST AND COMPARE IN PV ASSESSMENTS.	4/25/2014 6:56 AM
19	Only have used a few times. I think it's a wonderful tool. I see no need for improvement thus far.	4/24/2014 6:17 PM
20	More demand.	4/24/2014 6:13 PM
21	SEEMS FINE	4/24/2014 5:58 PM
22	I CANT OPEN IT;I EXTRACTED ALL FILES BUT IT LOCKS UP WHEN I USE REFRESH DATA ON EXCEL 2007; [redacted]	4/24/2014 5:05 PM
23	Educate the National Association of Realtors	4/24/2014 4:54 PM
24	Due to high electricity rates in Honolulu, PV Value tool seems to overvalue here. Tried the tool using numbers from the PV system on my residence and came up with value of over $40,000. Our system cost a little over $20,000 before rebates and a little over $10,000 after rebates.	4/24/2014 4:53 PM

25	I have retired from appraisal. I own several properties two which have solar arrays. I have worked with commercial property owqners in evaluating solar installations for commercial applications. I have found your toll to be helpful in that regard.	4/23/2014 1:31 PM
26	Web based would help. A course on using the tool. More auto fill fields.	4/21/2014 1:06 PM
27	It's the best thing going. By including the worksheet in my appraisal, I have found that underwriters and judges readily accept my valuation base upon the worksheet.	4/15/2014 4:01 PM
28	An online course that would show how to access all of its features	4/13/2014 9:41 AM
29	I believe only more wide usage by appraisers and real estate agents will help. It is as useful as possible until resales of properties begins and agents put the info in the listings.	4/10/2014 6:44 PM
30	DON'T KNOW	4/10/2014 5:07 PM
31	More focus and explanation of value expressed as either a cap rate and/or NPV of payments.	4/10/2014 3:23 PM
32	Very useful tool for something most appraisers never see. I have appraised 1 PV home out over 6,000 total appraised homes in 10 years. Just not very common.	4/10/2014 2:42 PM
33	Convince Realtors to fill out the Residential Green and Energy Efficient addendum! :)	4/10/2014 2:15 PM
34	Being able to modify the buyback rate fromnm the utility, or better yet to have the program do it automatically based upon the in-service date.	4/10/2014 1:56 PM
35	I felt it was very user friendly. I did have to read the instructions. But, having done that, I was able to utilize the tool and understand the result.	4/10/2014 1:44 PM
36	homeowner who used the system to help set market value - but not an installer or a real estate professional	4/10/2014 1:21 PM
37	as being a board member for the appraisal institute, i have listened to several presentations from both the third party "green commitees" and business owners of PV installation companies. Each entity has conflicting information regarding the longevity, warranties, value of the system after the initial install cost is recoporated, etc. I have listened to presentations at a residence where the sales man has no idea about information other than promoting being green and reducing electric bills. what seems odd to me, as per "solar city", if I pay $14,000 to have a system installed with a zero overage at the end of the year, that would take approx. 9.5 years to recoop my initial investment. As per the sales man, they have some type of magical formula that indicates the system will be worth 2.5% of the initial installation cost after a ten year period. I get better interest at the local credit union on a CD. They will proudly give a five year warranty on the entire system, however, what happens when the inverter goes out in eight years due to the excessive heat here in Southern Arizona? or when the cells start to fail due to the excessive heat, and instead of producing energy, the direct opposite happens and the cell will drain energy. Are there mini capasitors inbetween each cell? i duno. On paper, personal PV systems due not make financial sense. An appraiser can complete a discounted cash flow, and figure out an adjustment based on that. however, the underlaying fundamentals of the sales comparison approach is the substitution method. If the typical buyer does not reciprocate the value in the system, no adjustment is warranted. period.	4/10/2014 12:45 PM
38	Statistical data provided on discounts rates and a forum on the site for appraisers to chat about problems encountered.	4/10/2014 12:41 PM
39	Make it easier to use	4/10/2014 12:35 PM
40	cant think of any improvements; i think it was well done, thanks	4/10/2014 12:29 PM

Q1 In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)

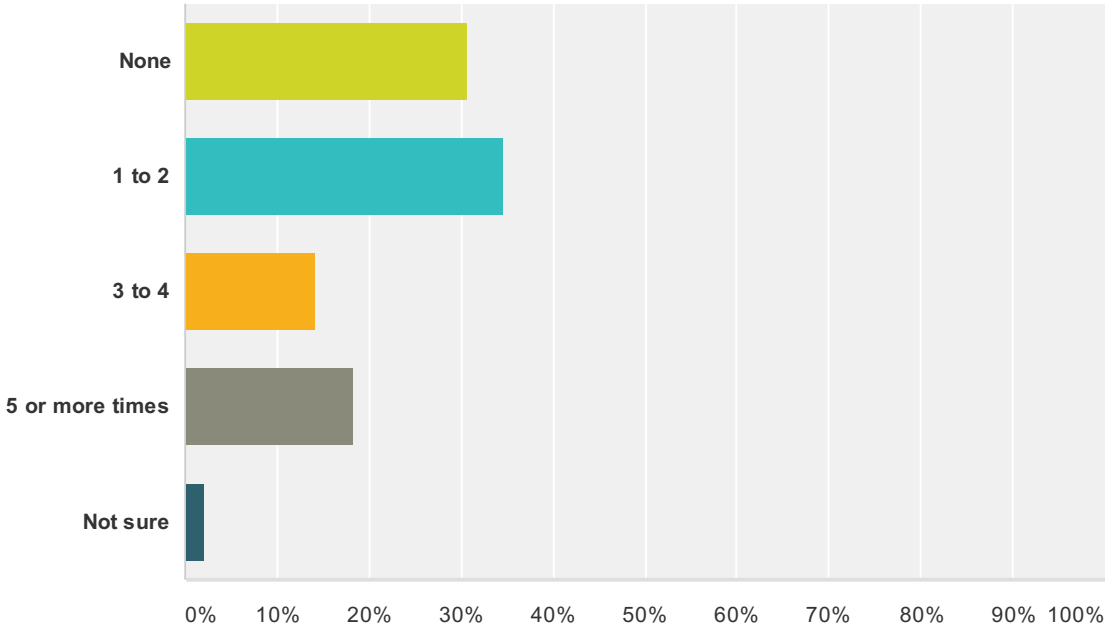
Answered: 49 Skipped: 0

#	Responses	Date
1	94062	5/15/2014 1:58 PM
2	94597	5/14/2014 4:58 PM
3	34135	5/14/2014 3:00 PM
4	30326	5/14/2014 2:20 PM
5	96793	5/14/2014 12:16 PM
6	32207	5/14/2014 10:44 AM
7	37130	5/14/2014 10:12 AM
8	68588	5/14/2014 10:08 AM
9	85297	5/14/2014 9:51 AM
10	77079	5/14/2014 9:30 AM
11	02760	5/14/2014 9:14 AM
12	44333	5/14/2014 9:02 AM
13	10007	4/30/2014 1:25 PM
14	52003	4/30/2014 11:28 AM
15	08558	4/30/2014 8:02 AM
16	91770	4/29/2014 10:49 AM
17	95630	4/28/2014 9:43 AM
18	23511	4/28/2014 5:29 AM
19	48197	4/25/2014 1:11 PM
20	96813	4/25/2014 1:06 PM
21	37087	4/25/2014 12:22 PM
22	96813	4/25/2014 12:05 PM
23	05482	4/25/2014 9:24 AM

24	93420	4/25/2014 7:54 AM
25	02760	4/25/2014 6:29 AM
26	32601	4/25/2014 6:11 AM
27	05055	4/25/2014 5:42 AM
28	17404	4/25/2014 5:00 AM
29	00544	4/25/2014 2:20 AM
30	12921	4/24/2014 7:32 PM
31	98270	4/24/2014 6:33 PM
32	78701	4/24/2014 6:21 PM
33	93950	4/24/2014 6:15 PM
34	96816	4/24/2014 6:06 PM
35	84060	4/24/2014 5:49 PM
36	05656	4/24/2014 5:10 PM
37	87111	4/24/2014 5:07 PM
38	88011	4/24/2014 4:59 PM
39	01301	4/18/2014 6:44 AM
40	02482	4/17/2014 3:16 PM
41	27401	4/16/2014 6:16 AM
42	10001	4/15/2014 2:38 AM
43	20852	4/14/2014 2:43 PM
44	63755	4/14/2014 12:38 PM
45	92807	4/14/2014 11:00 AM
46	78759	4/11/2014 11:23 AM
47	80237	4/10/2014 6:28 PM
48	79912	4/10/2014 2:08 PM
49	87043	4/10/2014 1:53 PM

Q2 How many times have you used the Photovoltaic (PV) Value® tool for a job assignment in the past year?

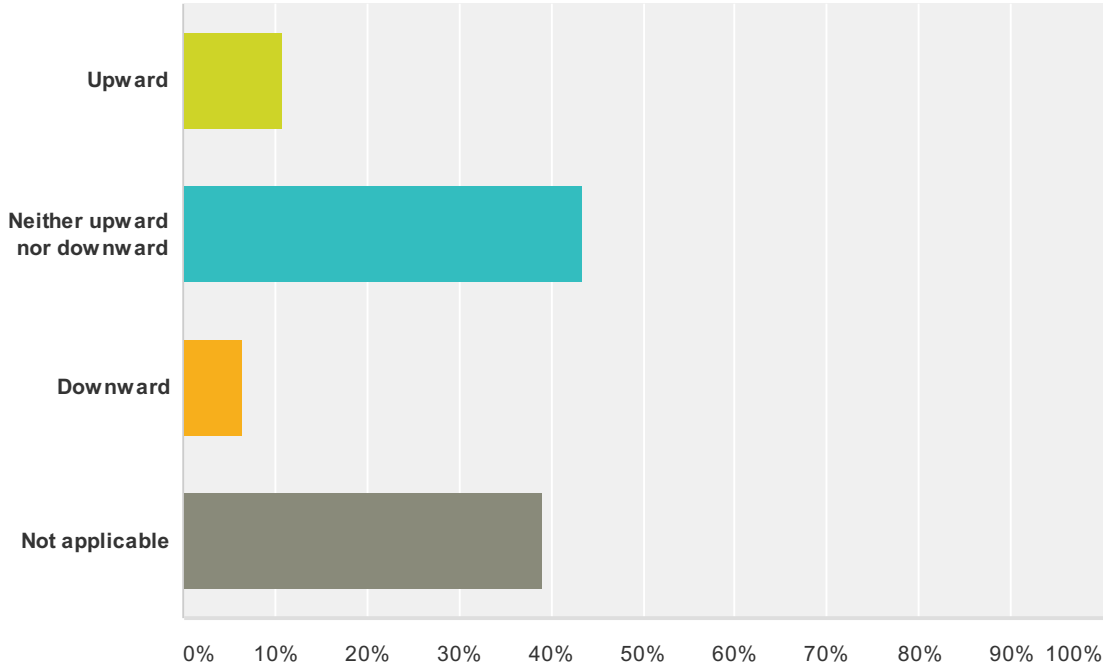
Answered: 49 Skipped: 0



Answer Choices	Responses	
None	**30.61%**	15
1 to 2	**34.69%**	17
3 to 4	**14.29%**	7
5 or more times	**18.37%**	9
Not sure	**2.04%**	1
Total		**49**

Q3 Did you make adjustments upward or downward from the range of values provided by the tool?

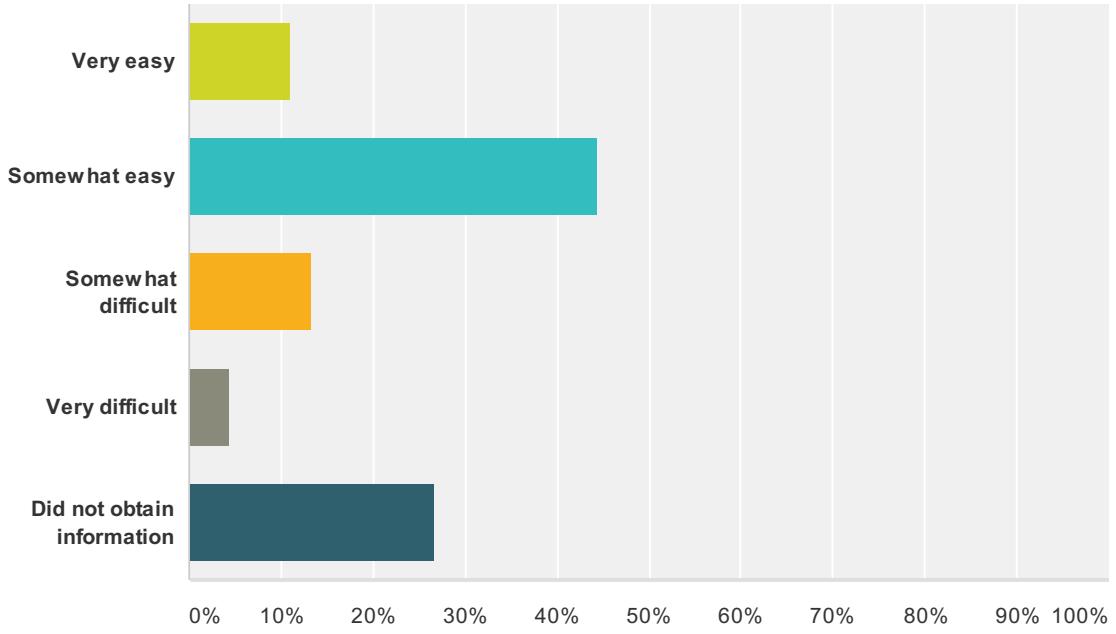
Answered: 46 Skipped: 3



Answer Choices	Responses	
Upward	**10.87%**	5
Neither upward nor downward	**43.48%**	20
Downward	**6.52%**	3
Not applicable	**39.13%**	18
Total		**46**

Q4 How easy was it to obtain PV system information from the property owner?

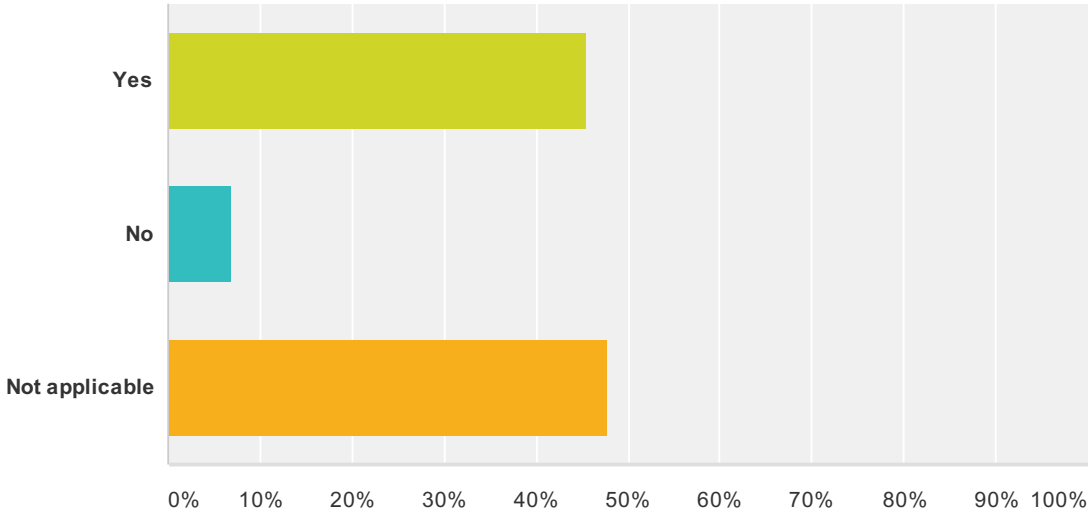
Answered: 45 Skipped: 4



Answer Choices	Responses	
Very easy	**11.11%**	5
Somewhat easy	**44.44%**	20
Somewhat difficult	**13.33%**	6
Very difficult	**4.44%**	2
Did not obtain information	**26.67%**	12
Total		**45**

Q5 If information was not available, were you still able to make an estimate using PV Value®?

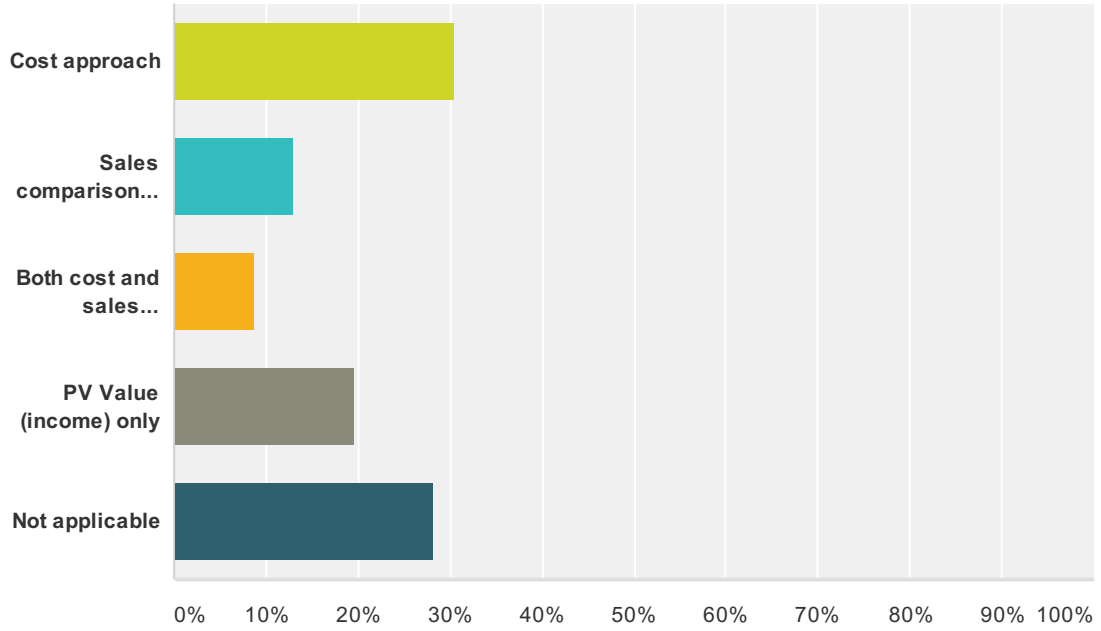
Answered: 44 Skipped: 5



Answer Choices	Responses	
Yes	**45.45%**	20
No	**6.82%**	3
Not applicable	**47.73%**	21
Total		**44**

Q6 In addition to using PV Value®, did you use the cost approach or sales comparison approach when developing a value conclusion?

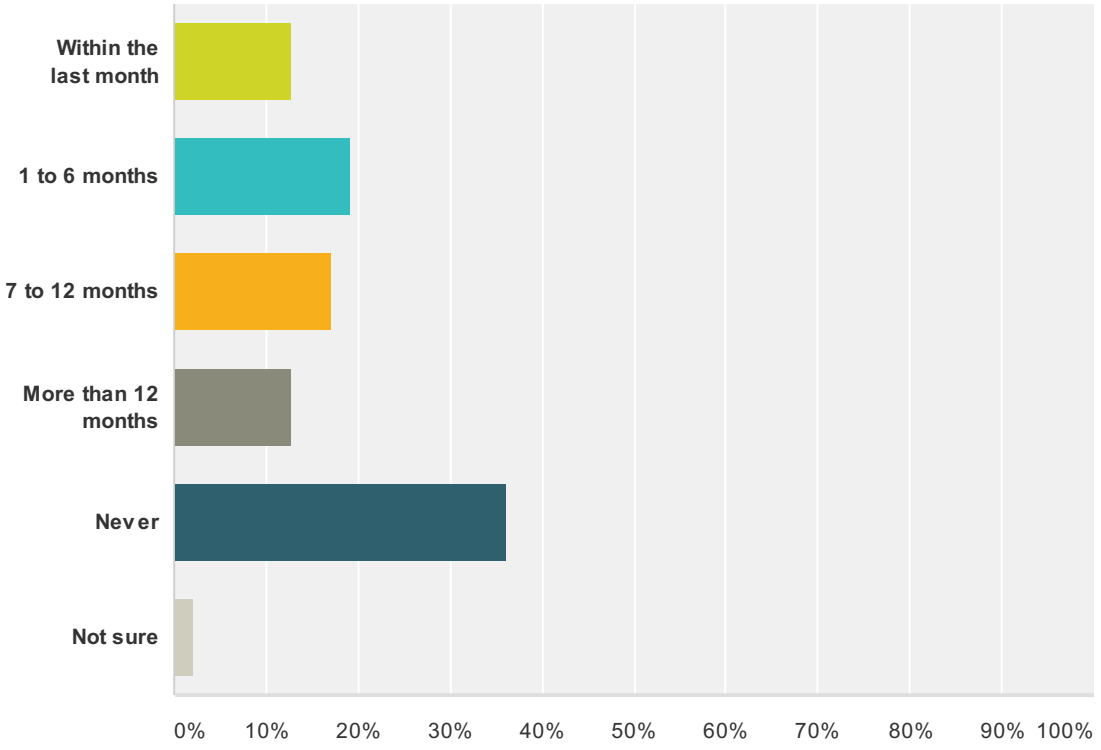
Answered: 46 Skipped: 3



Answer Choices	Responses	
Cost approach	**30.43%**	14
Sales comparison approach	**13.04%**	6
Both cost and sales comparison approaches	**8.70%**	4
PV Value (income) only	**19.57%**	9
Not applicable	**28.26%**	13
Total		**46**

Q7 How recently have you taken a course on appraising solar PV systems?

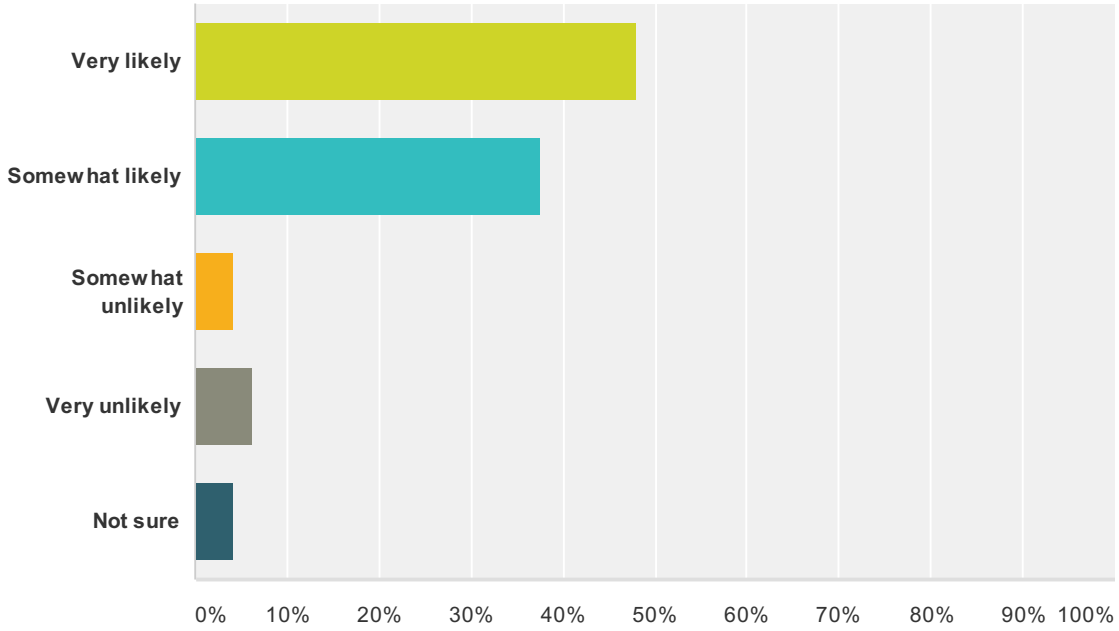
Answered: 47 Skipped: 2



Answer Choices	Responses	
Within the last month	**12.77%**	6
1 to 6 months	**19.15%**	9
7 to 12 months	**17.02%**	8
More than 12 months	**12.77%**	6
Never	**36.17%**	17
Not sure	**2.13%**	1
Total		**47**

Q8 How likely would you be to take an online course in valuing PV systems if the course met state certification CE requirements?

Answered: 48 Skipped: 1



Answer Choices	Responses	
Very likely	**47.92%**	23
Somewhat likely	**37.50%**	18
Somewhat unlikely	**4.17%**	2
Very unlikely	**6.25%**	3
Not sure	**4.17%**	2
Total		**48**

Q9 What basis point spread are you using (or would you use) to handle risk?

Answered: 31 Skipped: 18

#	Responses	Date
1	4	5/15/2014 1:58 PM
2	Used a discount override of 10.5%	5/14/2014 2:20 PM
3	Depends on historical output as compared to what was initially estimated by installation company.	5/14/2014 12:16 PM
4	n/a	5/14/2014 10:44 AM
5	250 to 350	5/14/2014 10:12 AM
6	Don't Remember	5/14/2014 9:51 AM
7	We are generally using a rate in line with that of the building appraised. The property appraised was a newly-constructed Class multifamily tower with a low discount rate to begin with.	5/14/2014 9:30 AM
8	500	5/14/2014 9:14 AM
9	1	4/30/2014 1:25 PM
10	1	4/30/2014 11:28 AM
11	1.50 to 3.50	4/28/2014 9:43 AM
12	9-9.5%	4/25/2014 12:05 PM
13	150-250	4/25/2014 6:29 AM
14	25	4/25/2014 6:11 AM
15	Private company outside investor discount rate which is Risk free rate Plus New York prime rate spread plus spread for local bank borrowing rate equals debt portion of discount rate to forecast interest costs then NY stock exchange implicit return on investment discount rate plus private company risk basis spread estimate which is at least five points in our market This discount rate is applied to net available cash flow after debt to obtain PV discounted cash flow which is value	4/25/2014 5:42 AM
16	-10%	4/25/2014 2:20 AM
17	2.5 on top of risk free rate.	4/24/2014 6:33 PM
18	discussion in class was about 50 basis points or more. Clearly, its arguable	4/24/2014 6:21 PM

19	The following is my discussion on discount rate: DISCOUNT RATE CONCLUSION There is not any literature to reference for discount rate conclusions as the valuation of photovoltaic systems within appraisal industry is recently new. Currently, for residential single family homes appraisers will generally rely on the Fannie Mae mortgage rates from 30 year fixed mortgages. For commercial properties, the rule of thumb has been to rely on published discount rate date for the specific property type; however, this does not capture all the risk and benefits of the system. Other items to consider are as follows: 1) Age of the system. Generally, owners of PV Systems will receive substantial Federal and State Tax Credits. As a result, the owner of the system agrees to file documents for five years certifying their ownership and if they sell before the five years they will have to repay the tax credits on a pro rata basis. The subject is three years old and if sold today the owner would have to repay a portion of the tax credits received. 2) Are Federal and State Tax Credits available? Yes, our interview with local PV providers indicates these incentives are still readily available in the market. 3) Has the cost of the PV equipment increased or decreased since installation? We have interviewed representatives from [redacted] who indicated that equipment is becoming cheaper. 4) Are there grid saturation issues from Hawaii Electric Company (HECO)? We spoke with representatives from HECO who indicated that systems below 100 kW would not be prevented from connection to the grid in the [redacted] They indicated the subject's 66.6 kW system could be installed without issue as of the date of the appraisal. 5) How long is the permitting process through the City and County of Honolulu, Department of Planning and Permitting? Representatives indicated three to six months. This was echoed by installers from [redacted]. The above points are not considered to be all encompassing but merely to illustrate the major components when considering an appropriate discount rate for the subject system. The current market conditions are very favorable to new buyers of PV systems due to the existence of Federal and State Tax credits readily available, no saturation issues and costs are decreasing. The argument for the subject is that a knowledge buyer would not pay 100% of the subject's costs as they could simply ask the seller to remove the system and purchase their own and enjoy the Federal and State Tax Credits, Pay less for the equipment, and enjoy a new system. In concluding a discount rate for the subject we have utilized our concluded discount rate of 9.0% and loaded it 100 bbp to account for the items above concluding 10%. We are only aware of one industrial sales transaction involving PV which was [redacted]. The building sold with a 41 kW system and the broker indicated they allocated approximately $100,000 to the system in the purchase which is equivalent to an 8.5% discount rate utilizing the PV Value tool. The broker indicated while the points we addressed are true, the buyer in that case was excited to have the system and believed it was an amenity to the property	4/24/2014 6:06 PM
20	Depends upon the property type	4/24/2014 5:49 PM
21	12%	4/24/2014 5:07 PM
22	Difference between 5 year Treasury and 5 year AAA Bonds, or 5 year AAA Bonds and 5 year A Bonds	4/24/2014 4:59 PM
23	4-10	4/18/2014 6:44 AM
24	For commercial 300-400 bp	4/17/2014 3:16 PM
25	200	4/16/2014 6:16 AM
26	200	4/15/2014 2:38 AM
27	200	4/14/2014 2:43 PM
28	50-200	4/14/2014 12:38 PM
29	5% to 6%	4/14/2014 11:00 AM
30	depeding on if it was existing or proposed - but for commercial proposed sites usually a 200 point spread.	4/11/2014 11:23 AM
31	150	4/10/2014 6:28 PM

Q10 What is the source of your "risk free" rate?

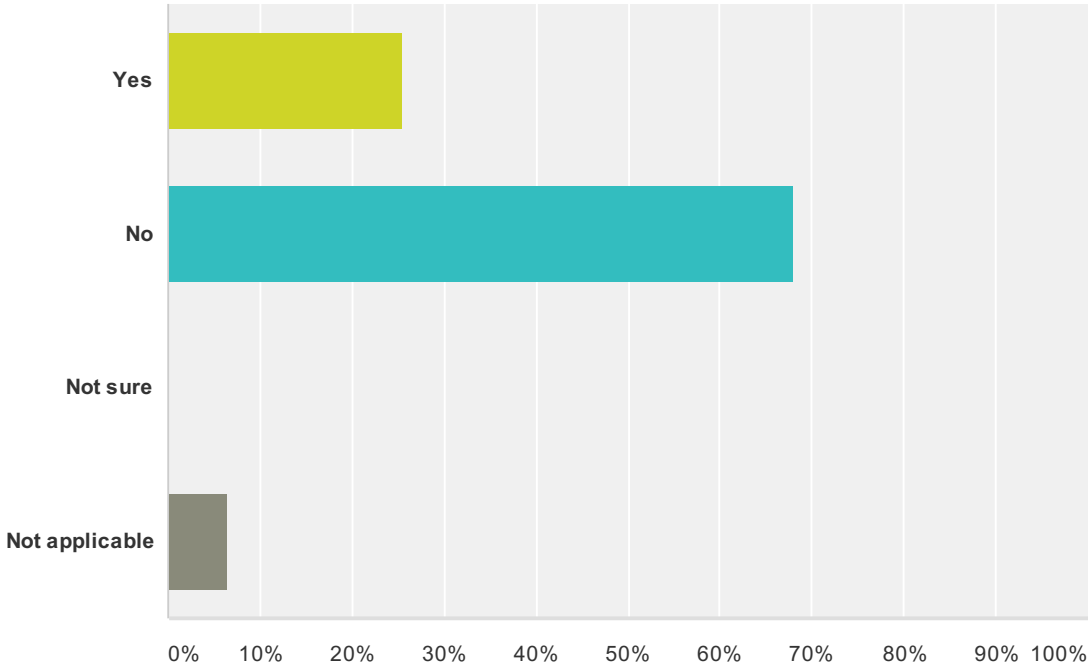
Answered: 29 Skipped: 20

#	Responses	Date
1	financial info	5/15/2014 1:58 PM
2	N/A	5/14/2014 12:16 PM
3	n/a	5/14/2014 10:44 AM
4	10 yr Treasury Bonds	5/14/2014 10:12 AM
5	General market data.	5/14/2014 9:30 AM
6	30 year T-bills	5/14/2014 9:14 AM
7	land lease rates	4/30/2014 1:25 PM
8	Interviews with users, banks, appraisers,	4/30/2014 11:28 AM
9	prime rate	4/28/2014 9:43 AM
10	Discount rates for properties	4/25/2014 12:05 PM
11	LIBOR, Fed Advanced Rate	4/25/2014 6:29 AM
12	local investors	4/25/2014 6:11 AM
13	Government 10 year treasury	4/25/2014 5:42 AM
14	UK met office	4/25/2014 2:20 AM
15	20 yr treasury bond	4/24/2014 6:33 PM
16	10-year treasury bonds from Federal Reserve's website	4/24/2014 6:21 PM
17	none	4/24/2014 6:06 PM
18	Varies - bond rate, for example	4/24/2014 5:49 PM
19	US treasuries	4/24/2014 5:07 PM
20	Financial Pages of Newspaper, Appraisal Journals, RealtyRates.com	4/24/2014 4:59 PM
21	Survey from AI Journial	4/18/2014 6:44 AM
22	U.S. Prime rate	4/17/2014 3:16 PM
23	Corporate bond rates - Financial Data Report, St Louis Federal Reserve	4/16/2014 6:16 AM
24	government bonds	4/15/2014 2:38 AM

25	Treasury bond yield	4/14/2014 2:43 PM
26	Market analysis and publications such as Realty Rates.	4/14/2014 12:38 PM
27	Average commercial mortgage rates	4/14/2014 11:00 AM
28	Bloomberg	4/11/2014 11:23 AM
29	30 year bond rate	4/10/2014 6:28 PM

Q11 Have you used any other tools for valuing a PV system?

Answered: 47 Skipped: 2



Answer Choices	Responses	
Yes	**25.53%**	12
No	**68.09%**	32
Not sure	**0.00%**	0
Not applicable	**6.38%**	3
Total		**47**

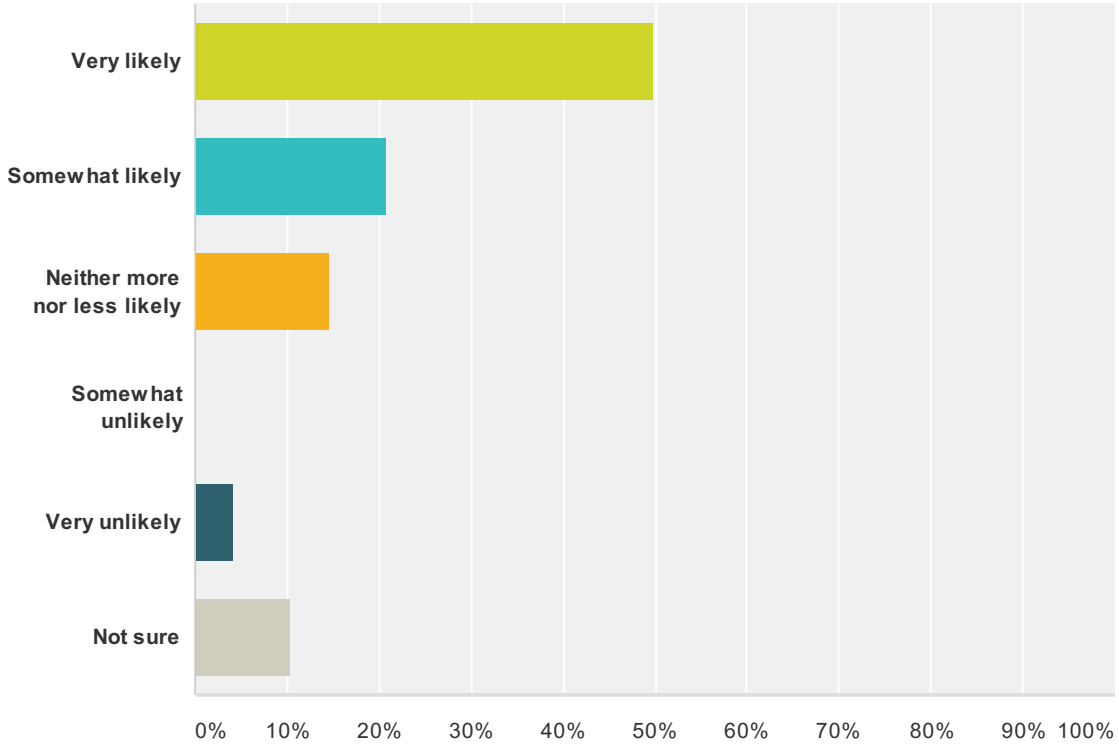
Q12 If you have used a different tool for valuing a PV system, what was its name?

Answered: 11 Skipped: 38

#	Responses	Date
1	True Cost of materials & install. No depreciation. Worked w/ installers of new systems.	5/14/2014 4:58 PM
2	N/A	5/14/2014 12:16 PM
3	DCF created in Excel	4/25/2014 6:29 AM
4	discounted cash flow of estimated cash flows	4/25/2014 5:42 AM
5	In house software	4/25/2014 2:20 AM
6	None	4/24/2014 6:33 PM
7	excel spreadsheet	4/24/2014 5:49 PM
8	My own spreadsheet	4/24/2014 5:07 PM
9	PW of monthly annuity over remaining Economic Life of solar system (used for solar hot water and solar heating & cooling systems also.	4/24/2014 4:59 PM
10	My own spread sheet. I use PV Value more for calculating production. For value, I can't use it because it lacks a deduction for annual maintenance (I use 5 cents per watt for taxes, insurance, monitoring and Maintenance).	4/17/2014 3:16 PM
11	and internal DCF spreadsheet	4/11/2014 11:23 AM

Q13 How likely are you to continue to use the PV Value® tool when it moves to a web-based platform?

Answered: 48 Skipped: 1

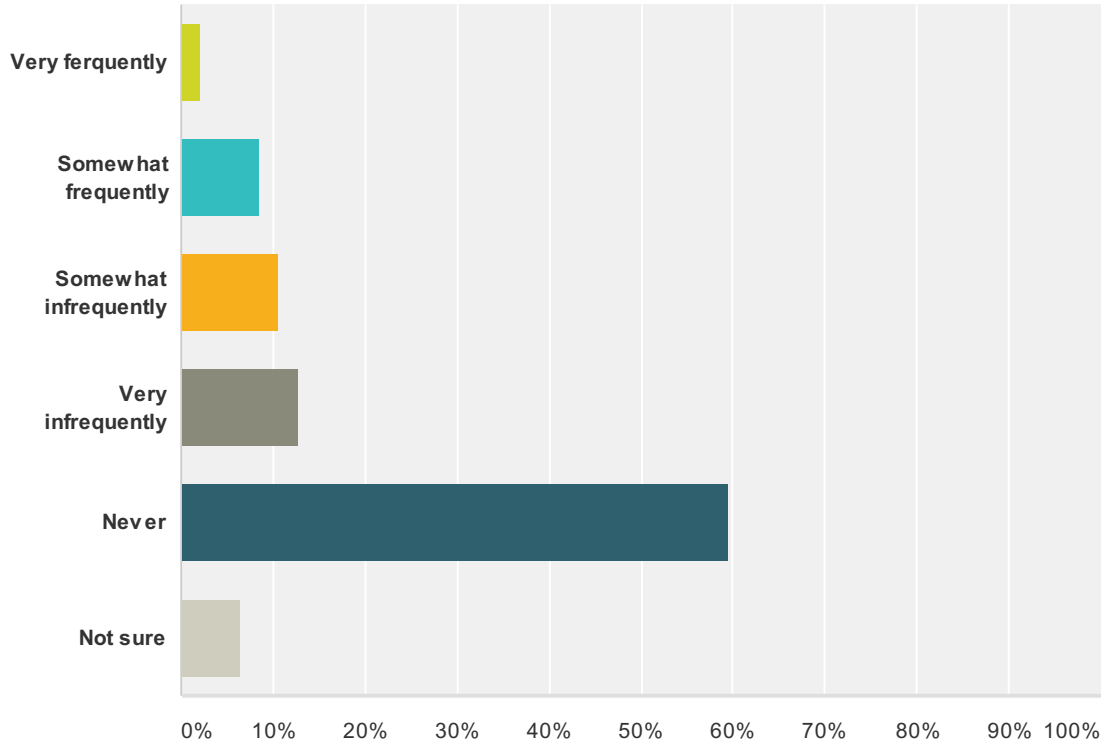


Answer Choices	Responses	
Very likely	**50.00%**	24
Somewhat likely	**20.83%**	10
Neither more nor less likely	**14.58%**	7
Somewhat unlikely	**0.00%**	0
Very unlikely	**4.17%**	2
Not sure	**10.42%**	5

Total	**48**

Q14 How frequently have you used PV Value® to develop the value of renewable energy credits (RECs or SRECs) or production based incentives (PBIs)?

Answered: 47 Skipped: 2

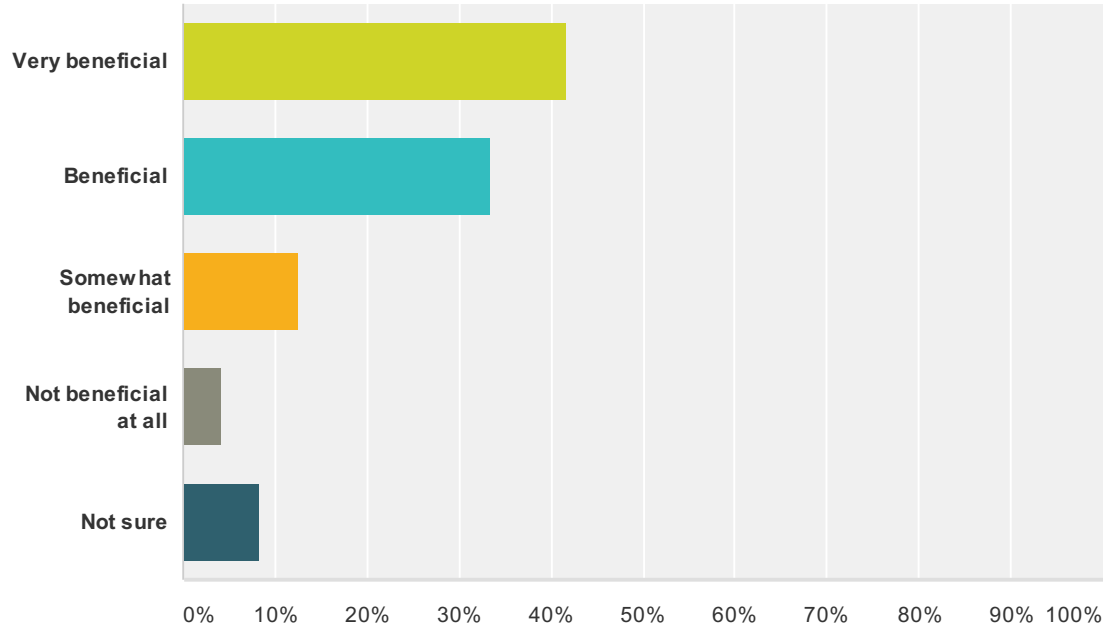


Answer Choices	Responses	
Very ferquently	**2.13%**	1
Somewhat frequently	**8.51%**	4
Somewhat infrequently	**10.64%**	5
Very infrequently	**12.77%**	6
Never	**59.57%**	28

Not sure	**6.38%**	3
Total		**47**

Q15 How beneficial would access to appraised values of PV systems in your market area be to your practice?

Answered: 48 Skipped: 1



Answer Choices	Responses	
Very beneficial	**41.67%**	20
Beneficial	**33.33%**	16
Somewhat beneficial	**12.50%**	6
Not beneficial at all	**4.17%**	2
Not sure	**8.33%**	4
Total		**48**

Q16 What would make the PV Value® tool more useful?

Answered: 19 Skipped: 30

#	Responses	Date
1	An integrated definition of the terms used, through pop-ups. A REC module. A table or link to the source of the commercial rate from which the price per kwh is obtained.	5/14/2014 2:20 PM
2	No comments at this time	5/14/2014 12:16 PM
3	I use it for contributory value of a property component for appraisal purposes.	5/14/2014 10:44 AM
4	Better guidance to accepted discount rates. Even our institutional clients are generally in the dark on this.	5/14/2014 9:30 AM
5	Glossary of defined terms and a key that helps with unit conversion. Our office only runs into 3-4 PV assignments a year, so it is hard to remember some of the finer points.	5/14/2014 9:14 AM
6	More opportunities to appraise such property in Iowa	4/30/2014 11:28 AM
7	Being able to understand and see how the cells are calculated. Better understanding or the discount cash flow. THANKS!	4/28/2014 9:43 AM
8	Survey Questions 4 & 5 are misleading - sufficient system information is public in Vermont to value with PV Value. Questions 9 & 10 are irrelevant in Vermont because rates are bid through a pool (larger arrays) or fixed by law.	4/25/2014 9:24 AM
9	frequently updated data on various treasury rates NY prime rates NY stock exchange implicit discount rate info on private out side investor discount rates in new businesses The discount rates "bogey" in your system is just ridiculously low as to be no help	4/25/2014 5:42 AM
10	Nothing really	4/25/2014 2:20 AM
11	More installations of systems.	4/24/2014 6:33 PM
12	I have not used it enough to make a suggestion.	4/24/2014 5:07 PM
13	Have wider application for solar amenities than just PV systems	4/24/2014 4:59 PM
14	Very impressive tool, thanks for providing it.	4/18/2014 6:44 AM
15	See Number 12. It's rather ambitious, but if you could include another line of income for SRECs and a separate discount rate, that would be great.	4/17/2014 3:16 PM
16	Slightly more precise explanation of use.	4/16/2014 6:16 AM
17	I tool to confirm proposed system size relative to energy use for new construction. Additional line items for credits and benefits for proposed systems. For example, in California, new systems and their contribution to value are exempt from property tax increases.	4/14/2014 11:00 AM
18	I used PV Value while taking the AI 2 day seminar on appraising solar...I haven't had any assignments yet. But I think the site is great and hope I have an opportunity to begin doing appraisals on solar. Thanks for all your hard work!	4/10/2014 2:08 PM
19	more properties that have a PV system in place so we could get comparables and perform appraisals for this type of property.	4/10/2014 1:53 PM

Q1 In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)

Answered: 10 Skipped: 0

#	Responses	Date
1	91355	5/15/2014 2:44 PM
2	34604	4/30/2014 12:21 PM
3	88061	4/25/2014 10:06 PM
4	88007	4/25/2014 10:09 AM
5	85003	4/25/2014 9:14 AM
6	02186	4/25/2014 6:05 AM
7	85021	4/24/2014 8:36 PM
8	85083	4/24/2014 6:33 PM
9	95991	4/24/2014 5:02 PM
10	89052	4/10/2014 6:09 PM

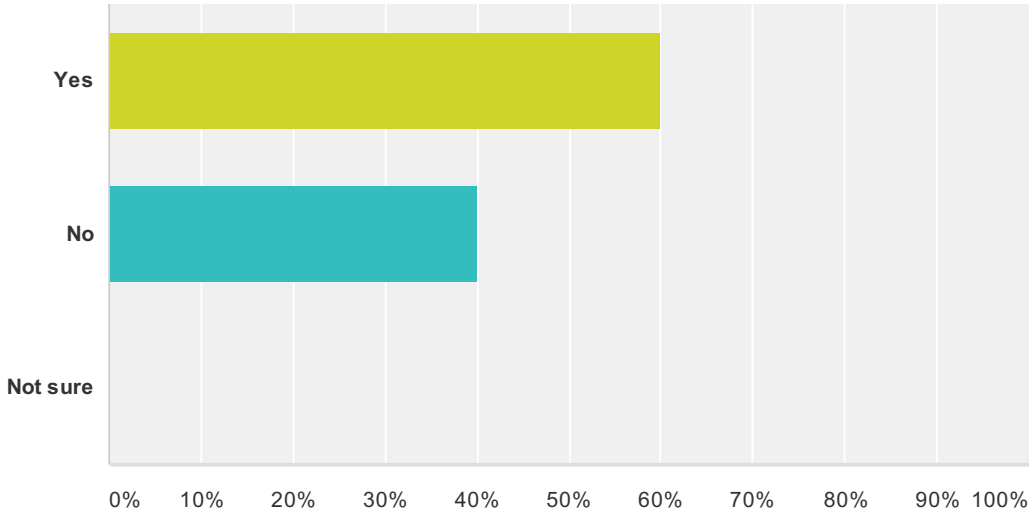
Q2 Please explain your overall interest in the Photovoltaic (PV) Value® tool.

Answered: 9 Skipped: 1

#	Responses	Date
1	Real Estate valuation	5/15/2014 2:44 PM
2	GREEN REALTOR	4/30/2014 12:21 PM
3	I represent energy efficient properties with active solar and our local appraisers say they do not know how to provide a value for the systems.	4/25/2014 10:06 PM
4	Help establish values for homes with Photovoltaic.	4/25/2014 10:09 AM
5	Top 10 US builder, includes PV as option in all homes	4/25/2014 9:14 AM
6	I am a solar developer helping companies leverage the various incentives, both state and local. There is a big learning curve for these entities and PV Value helps many of them understand some of the mechanics of the transactions I'm proposing.	4/25/2014 6:05 AM
7	I teach about sustainable homes, live in one, and remodel green homes	4/24/2014 8:36 PM
8	Energy Engineer and ECO Broker. Hope to use it in marketing.	4/24/2014 5:02 PM
9	I am listing a house with PV, and wanted to know approximately how much value the PV system added to the property's value.	4/10/2014 6:09 PM

Q3 Have you listed any homes with solar PV systems in the last 5 years?

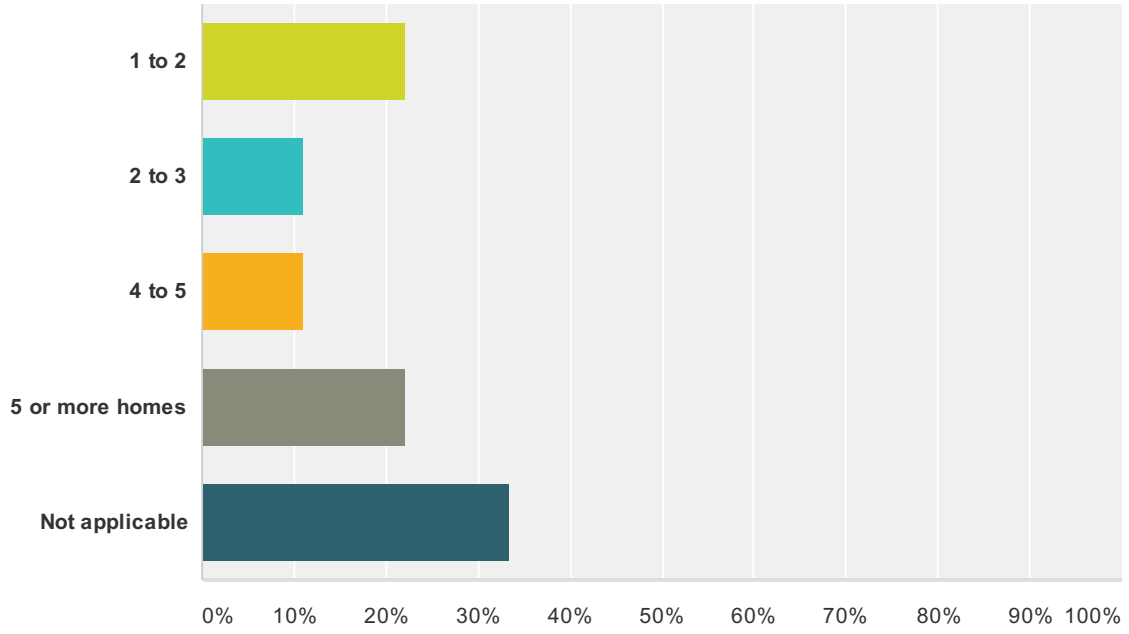
Answered: 10 Skipped: 0



Answer Choices	Responses	
Yes	**60.00%**	6
No	**40.00%**	4
Not sure	**0.00%**	0
Total		**10**

Q4 If "Yes," how many homes with solar PV have you listed in the last 5 years?

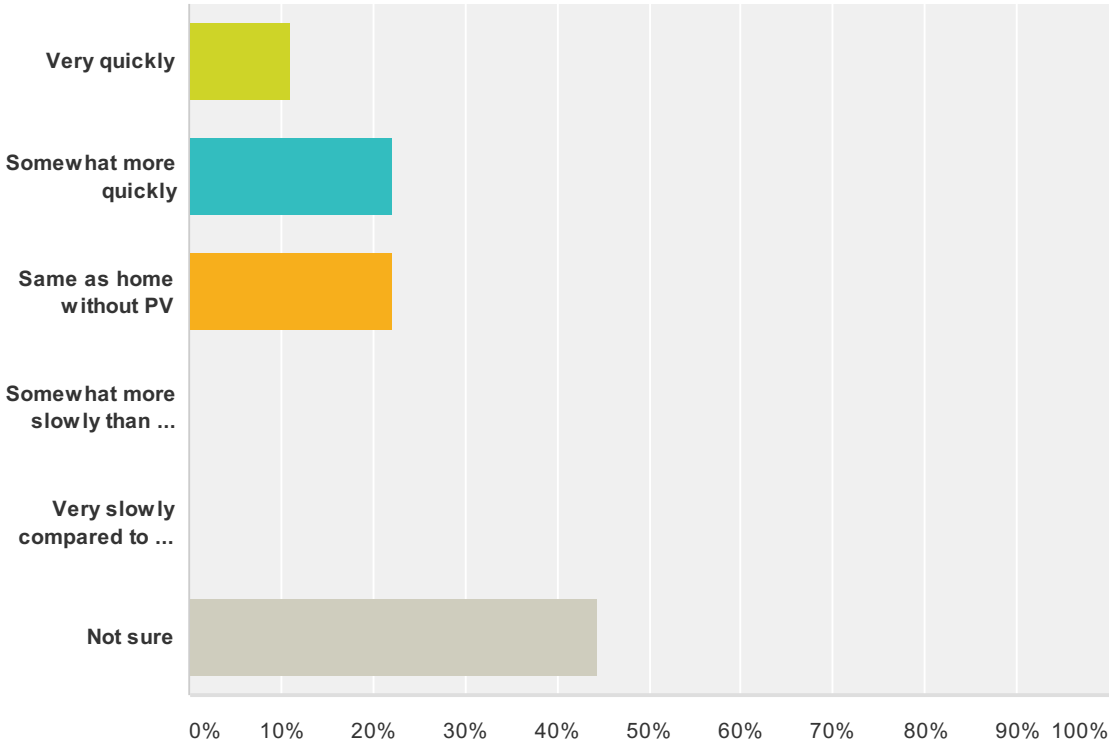
Answered: 9 Skipped: 1



Answer Choices	Responses	
1 to 2	**22.22%**	2
2 to 3	**11.11%**	1
4 to 5	**11.11%**	1
5 or more homes	**22.22%**	2
Not applicable	**33.33%**	3
Total		**9**

Q5 Did the home with solar PV sell more quickly than a home without solar PV?

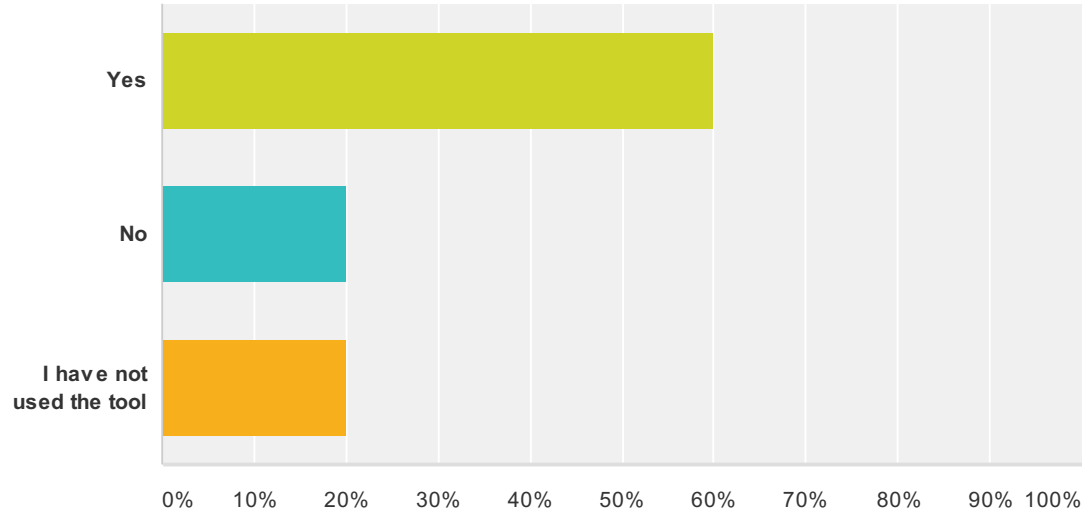
Answered: 9 Skipped: 1



Answer Choices	Responses	
Very quickly	**11.11%**	1
Somewhat more quickly	**22.22%**	2
Same as home without PV	**22.22%**	2
Somewhat more slowly than a home without PV	**0.00%**	0
Very slowly compared to a home without PV	**0.00%**	0
Not sure	**44.44%**	4
Total		**9**

Q6 Have you suggested the PV Value® tool to homeowners if they were not previously aware of it?

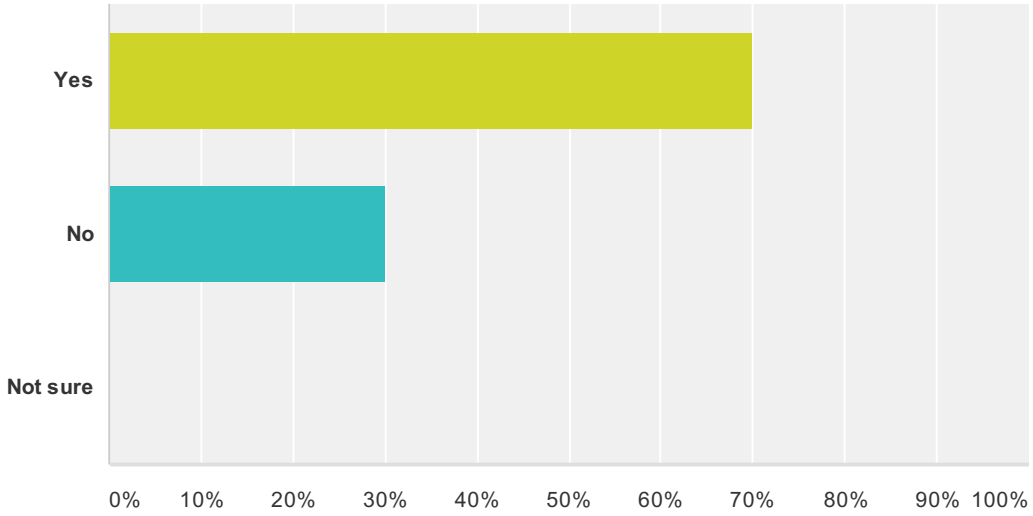
Answered: 10 Skipped: 0



Answer Choices	Responses	
Yes	**60.00%**	6
No	**20.00%**	2
I have not used the tool	**20.00%**	2
Total		**10**

Q7 Have you used the PV Value® tool to develop a value as part of a "market analysis" for a homeowner?

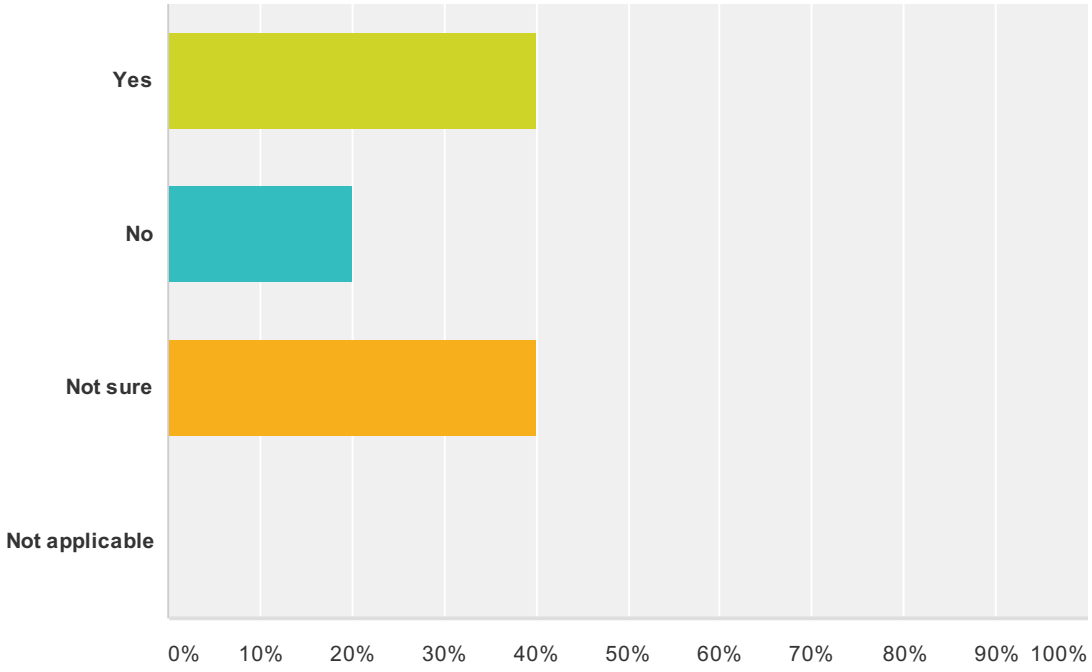
Answered: 10 Skipped: 0



Answer Choices	Responses	
Yes	**70.00%**	7
No	**30.00%**	3
Not sure	**0.00%**	0
Total		**10**

Q8 Does the local MLS in your area provide data entry fields for PV systems?

Answered: 10 Skipped: 0



Answer Choices	Responses	
Yes	**40.00%**	4
No	**20.00%**	2
Not sure	**40.00%**	4
Not applicable	**0.00%**	0
Total		**10**

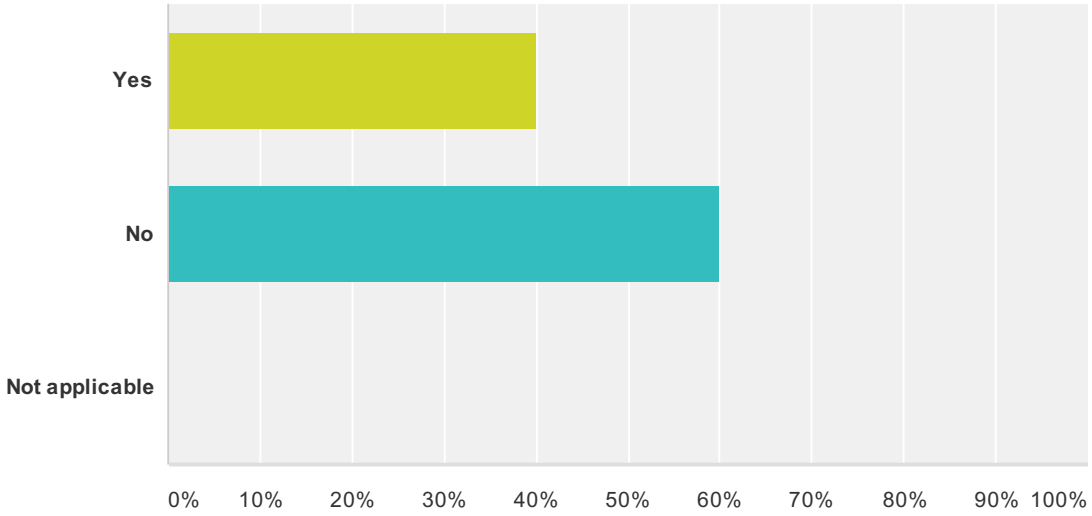
Q9 When listing the property, what MLS fields did you use to enter the PV system details?

Answered: 8 Skipped: 2

#	Responses	Date
1	Comments section	5/15/2014 2:44 PM
2	energy efficency	4/30/2014 12:21 PM
3	Active solar	4/25/2014 10:06 PM
4	Remarks	4/25/2014 10:09 AM
5	Features	4/25/2014 9:14 AM
6	NA	4/25/2014 6:05 AM
7	Kw hours lease or own grid tied or off grid	4/24/2014 8:36 PM
8	Utility Information; Energy Description (to note energy efficient features); Green Features	4/10/2014 6:09 PM

Q10 Are you aware of AI Form 820.04 - Residential Green and Energy Efficient Addendum?

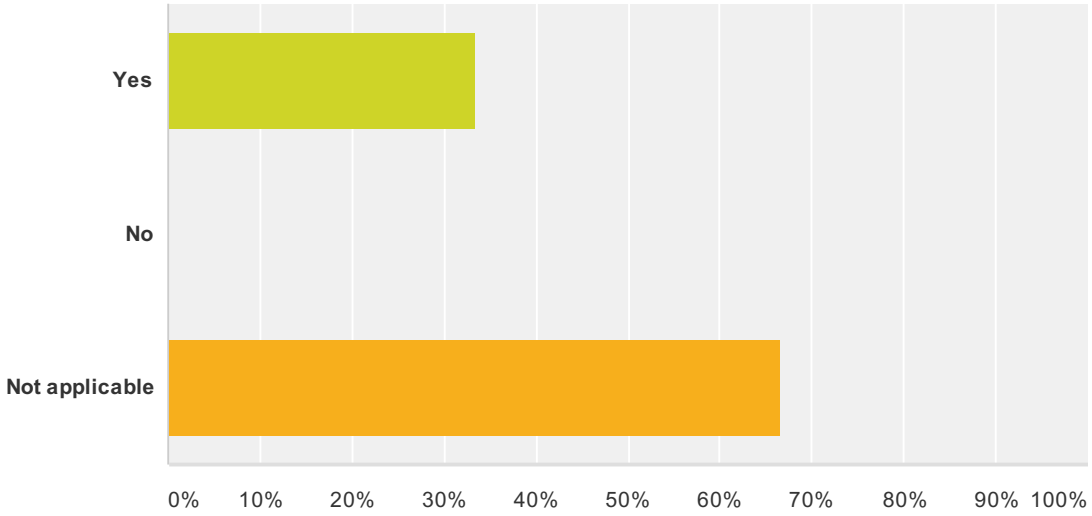
Answered: 10 Skipped: 0



Answer Choices	Responses	
Yes	**40.00%**	4
No	**60.00%**	6
Not applicable	**0.00%**	0
Total		**10**

Q11 If "Yes," was this form helpful when capturing the property details for a PV system?

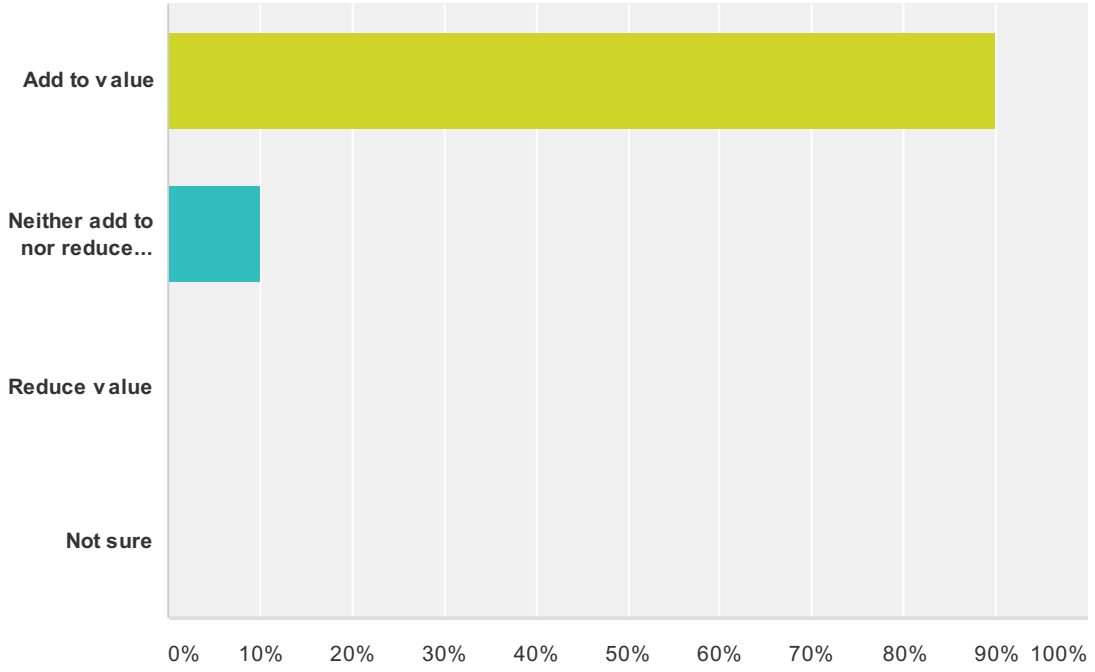
Answered: 9 Skipped: 1



Answer Choices	Responses	
Yes	**33.33%**	3
No	**0.00%**	0
Not applicable	**66.67%**	6
Total		**9**

Q12 Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?

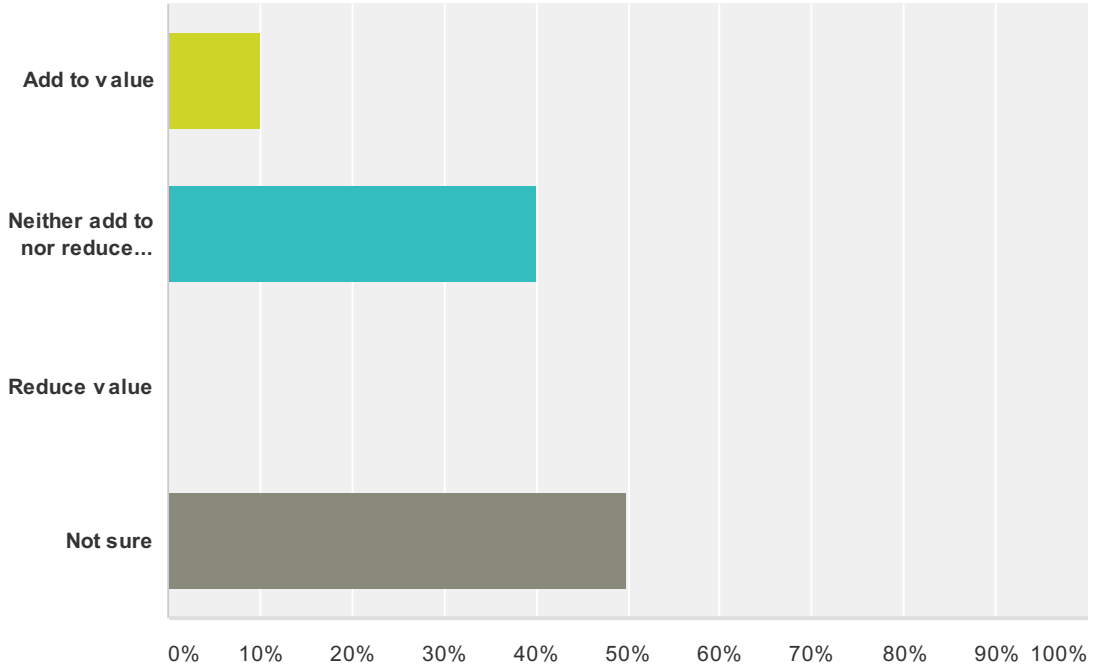
Answered: 10 Skipped: 0



Answer Choices	Responses	
Add to value	**90.00%**	9
Neither add to nor reduce value	**10.00%**	1
Reduce value	**0.00%**	0
Not sure	**0.00%**	0
Total		**10**

Q13 Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?

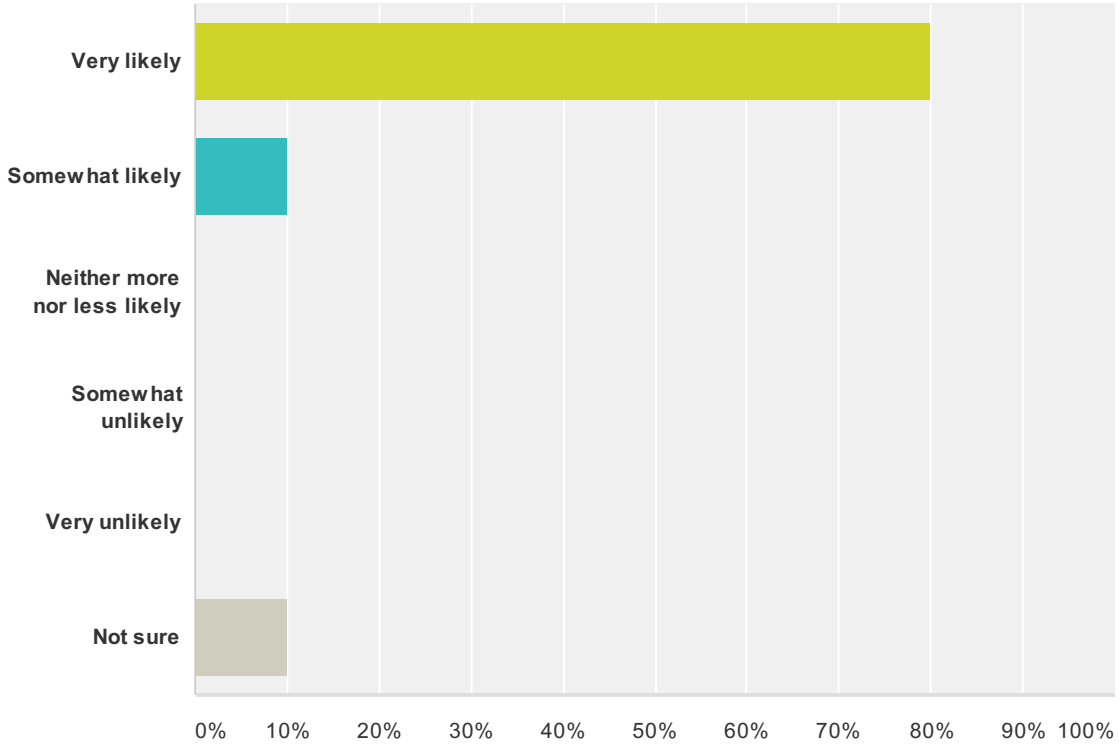
Answered: 10 Skipped: 0



Answer Choices	Responses	
Add to value	**10.00%**	1
Neither add to nor reduce value	**40.00%**	4
Reduce value	**0.00%**	0
Not sure	**50.00%**	5
Total		**10**

Q14 How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?

Answered: 10 Skipped: 0

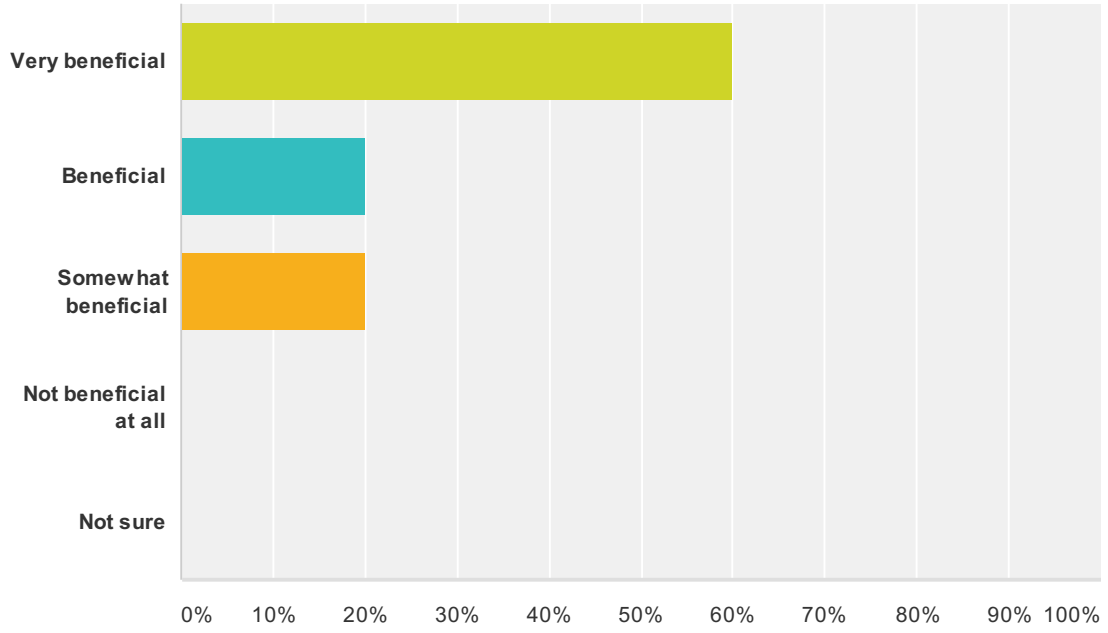


Answer Choices	Responses	
Very likely	**80.00%**	8
Somewhat likely	**10.00%**	1
Neither more nor less likely	**0.00%**	0
Somewhat unlikely	**0.00%**	0
Very unlikely	**0.00%**	0
Not sure	**10.00%**	1

Total	**10**

Q15 How beneficial would access to appraised values of PV systems in your market area be to your practice?

Answered: 10 Skipped: 0



Answer Choices	Responses	
Very beneficial	**60.00%**	6
Beneficial	**20.00%**	2
Somewhat beneficial	**20.00%**	2
Not beneficial at all	**0.00%**	0
Not sure	**0.00%**	0
Total		**10**

Q16 If you have used the PV Value® tool, what would make it more useful?

Answered: 5 Skipped: 5

#	Responses	Date
1	simplyfy	4/30/2014 12:21 PM
2	Have it sent to all licensed appraisers and all lenders.	4/25/2014 10:09 AM
3	easier populate slope and orientation	4/25/2014 9:14 AM
4	I'd like to be able to include the value of SRECs, ZRECs, or other state incentives in a variable line. My practice is strictly commercial real estate-related.	4/25/2014 6:05 AM
5	I was not able to use the PV Value, because it would not function with my version of Excel, which is not a full version with macros.	4/10/2014 6:09 PM

Q1 In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)

Answered: 6 Skipped: 0

#	Responses	Date
1	05048	5/14/2014 10:53 AM
2	05001	5/14/2014 9:26 AM
3	95030	5/14/2014 9:24 AM
4	91001	4/28/2014 2:01 PM
5	85705	4/26/2014 3:11 PM
6	94111	4/10/2014 12:11 PM

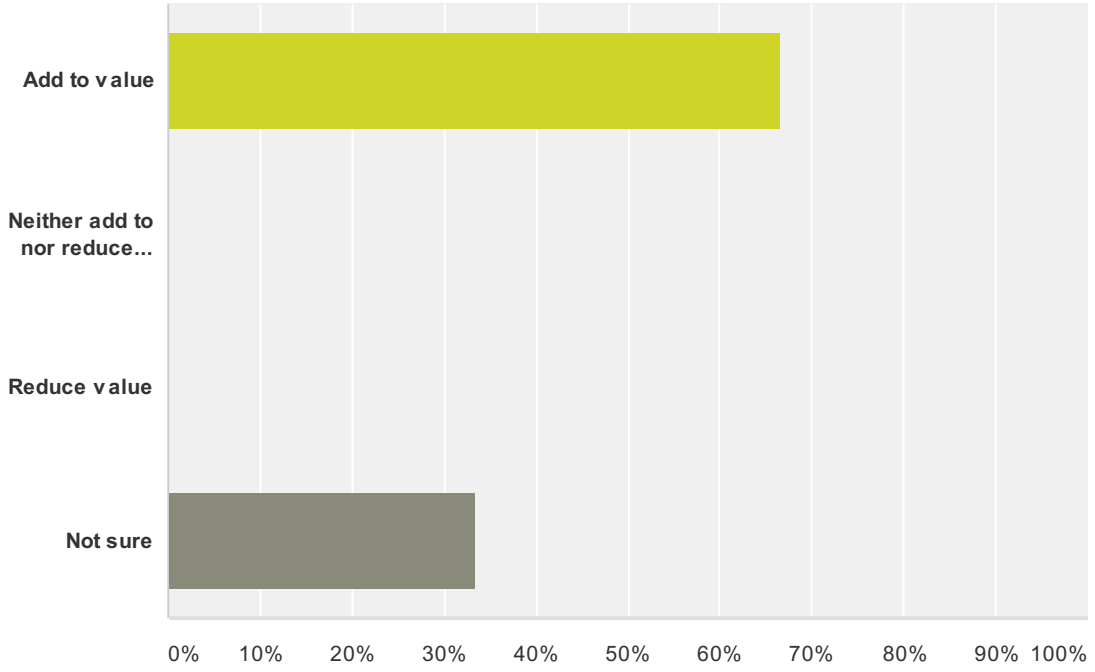
Q2 Please explain your overall interest in the Photovoltaic (PV) Value® tool.

Answered: 5 Skipped: 1

#	Responses	Date
1	I am unfamiliar with it	5/14/2014 10:53 AM
2	I'm a developer	5/14/2014 9:26 AM
3	Want to recommend valuation tool to clients, appraisers and others to establish data base for solar value contribution to house value.	4/28/2014 2:01 PM
4	In pursuing widespread adoption of solar, we need tools to track and demonstrate the added value to homes when solar in installed. We also need tools which can help homebuyers understand the different value of the same physical system if it is owned verses leased monthly verses leased prepaid.	4/26/2014 3:11 PM
5	We are using the PV Value tool to provide value's of proposed PV systems to determine the amount of mortgage proceeds to lend.	4/10/2014 12:11 PM

Q3 Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?

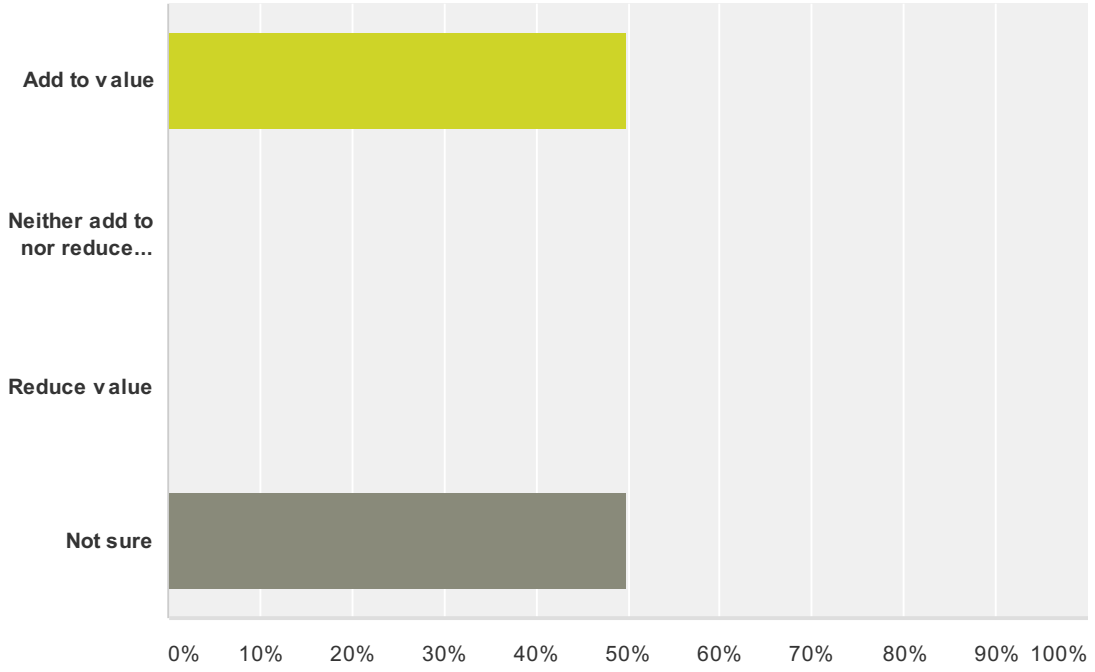
Answered: 6 Skipped: 0



Answer Choices	Responses	
Add to value	**66.67%**	4
Neither add to nor reduce value	**0.00%**	0
Reduce value	**0.00%**	0
Not sure	**33.33%**	2
Total		**6**

Q4 Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?

Answered: 6 Skipped: 0



Answer Choices	Responses	
Add to value	**50.00%**	3
Neither add to nor reduce value	**0.00%**	0
Reduce value	**0.00%**	0
Not sure	**50.00%**	3
Total		**6**

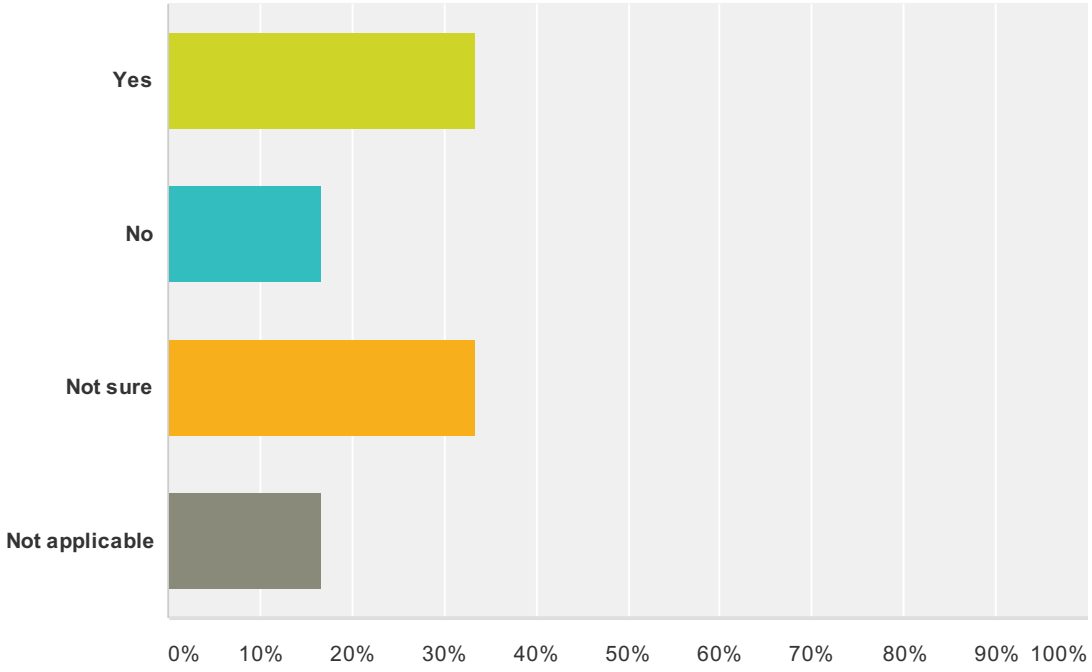
Q5 What challenges do you encounter that make it difficult to understand the value added by a PV system?

Answered: 5 Skipped: 1

#	Responses	Date
1	The uncertainty of what kWh costs will be in the future.	5/14/2014 10:53 AM
2	haven't gone down this road yet.	5/14/2014 9:26 AM
3	Market comps difficult to ID. Real estate agents don't care or work against.	4/28/2014 2:01 PM
4	Two things: 1. There are few comps available to demonstrate the added value of solar from a market based perspective. 2. The same physical system can have very different value depending on who owns it and under what terms. It is difficult for realtors and appraisers to understand these differences.	4/26/2014 3:11 PM
5	Estimating the savings over the life of the system, which PV Value helps with.	4/10/2014 12:11 PM

Q6 Do you believe PV systems add risk to the loan when included in value of the property?

Answered: 6 Skipped: 0



Answer Choices	Responses	
Yes	33.33%	2
No	16.67%	1
Not sure	33.33%	2
Not applicable	16.67%	1
Total		6

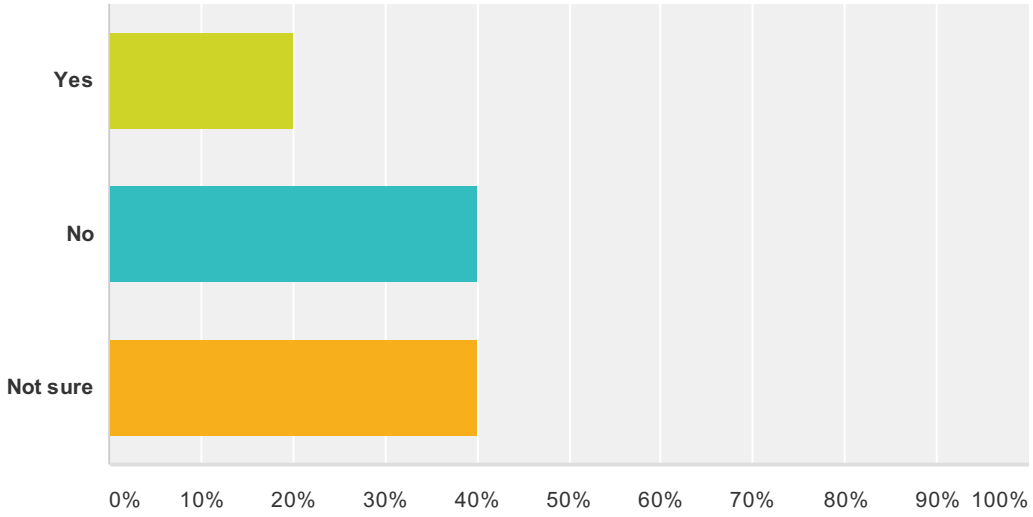
Q7 If "Yes," describe the risk added and how that may be remediated.

Answered: 2 Skipped: 4

#	Responses	Date
1	The principle risk is that if the full value of a system is included in the sale of a home, changing energy rates in the future, or failures of the system could cause a reduction of that value and a loss to the homeowner.	4/26/2014 3:11 PM
2	Yes, but we feel that we are able to mitigate the risks presented in various ways.	4/10/2014 12:11 PM

Q8 Are you aware of any Fannie Mae, Freddie Mac, HUD, VA restrictions on recognizing the value of a PV system?

Answered: 5 Skipped: 1



Answer Choices	Responses	
Yes	**20.00%**	1
No	**40.00%**	2
Not sure	**40.00%**	2
Total		**5**

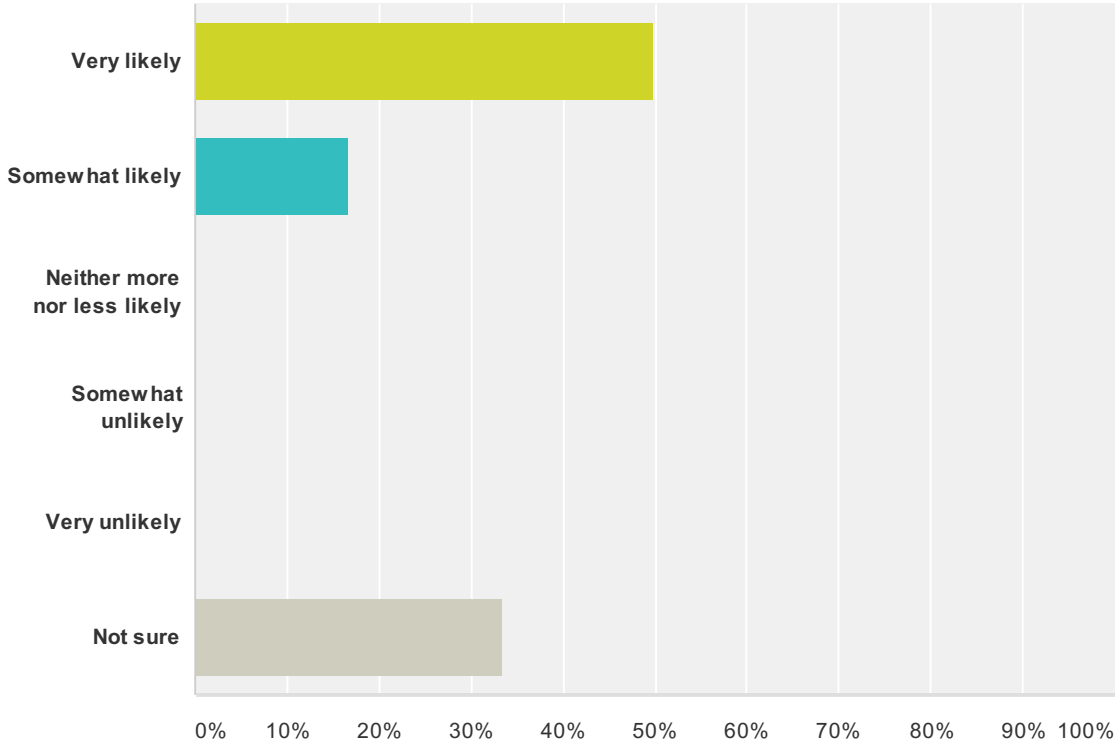
Q9 If "Yes," what specifically are those restrictions you've encountered?

Answered: 1 Skipped: 5

#	Responses	Date
1	We are currently working with Fannie Mae and Freddie Mac to recognize the savings generated by a PV system in multifamily mortgage underwriting.	4/10/2014 12:11 PM

Q10 How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?

Answered: 6 Skipped: 0



Answer Choices	Responses	
Very likely	**50.00%**	3
Somewhat likely	**16.67%**	1
Neither more nor less likely	**0.00%**	0
Somewhat unlikely	**0.00%**	0
Very unlikely	**0.00%**	0
Not sure	**33.33%**	2

Total	**6**

Q11 What would make the PV Value® tool more useful?

Answered: 4 Skipped: 2

#	Responses	Date
1	It was too cumbersome as a spreadsheet for the average user. Hope the web tool is better.	5/14/2014 9:26 AM
2	more nuanced rate data base. IOU in CA much more expensive rates. Useful to include details.	4/28/2014 2:01 PM
3	Better descriptions of how to enter historical data for a site to get accurate assesment of system performance, as well as better descriptions of the financial terms and assumptions to use.	4/26/2014 3:11 PM
4	Would be happy to discuss what could make the tool more useful. Please contact me at [redacted]	4/10/2014 12:11 PM

Q1 In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)

Answered: 18 Skipped: 0

#	Responses	Date
1	05764	5/16/2014 7:36 AM
2	05476	5/14/2014 1:06 PM
3	78626	5/14/2014 11:54 AM
4	83616	5/14/2014 10:56 AM
5	05001	5/14/2014 10:18 AM
6	56075	5/14/2014 9:42 AM
7	01614	5/14/2014 9:26 AM
8	95355	5/14/2014 9:07 AM
9	05001	4/30/2014 11:03 AM
10	02494	4/28/2014 6:27 AM
11	08536	4/25/2014 7:13 AM
12	05767	4/25/2014 6:29 AM
13	05142	4/24/2014 4:53 PM
14	89509	4/11/2014 3:47 PM
15	33102	4/11/2014 10:06 AM
16	05855	4/11/2014 8:10 AM
17	75068	4/10/2014 12:51 PM
18	05601	4/10/2014 12:04 PM

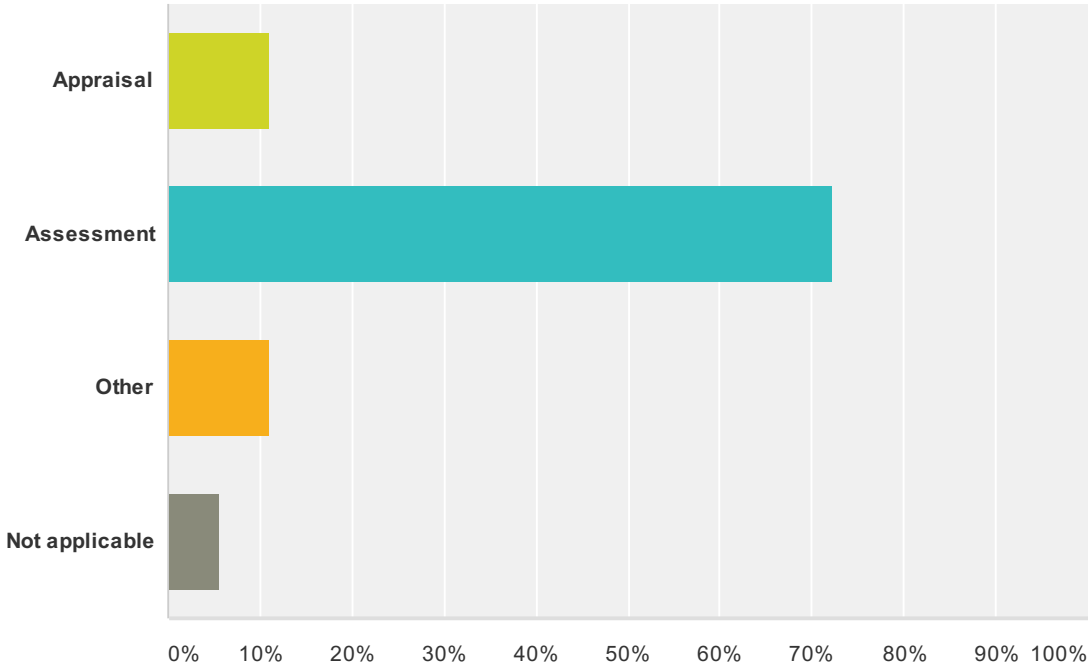
Q2 Please explain your overall interest in the Photovoltaic (PV) Value® tool.

Answered: 18 Skipped: 0

#	Responses	Date
1	interested but find impossible to access	5/16/2014 7:36 AM
2	Solar panel value program the state of Vermont wants us to use	5/14/2014 1:06 PM
3	use for solar residential valuation	5/14/2014 11:54 AM
4	Research and Value Assesment	5/14/2014 10:56 AM
5	Very interested since the Vermont Tax Department has suggested we use it.	5/14/2014 10:18 AM
6	It is good	5/14/2014 9:42 AM
7	I work in city assessment office. We do value solar energy improvements - although they are exempt for 15 years.	5/14/2014 9:26 AM
8	Assessor's Office - valuing solar systems in place at the time of property transfer and/or reassessment	5/14/2014 9:07 AM
9	Rather than reinventing the wheel we chose to use PV value	4/30/2014 11:03 AM
10	Considering and supporting options for municipal solar.	4/28/2014 6:27 AM
11	Value added	4/25/2014 7:13 AM
12	Educating home owners, builders, architects, appraisers, realtors, & lenders.	4/25/2014 6:29 AM
13	We are installing a 150 KW system and will be selling it in a few years at its then FMV.	4/24/2014 4:53 PM
14	Government agency interest inpromoting tools that assist in the valuation of renewable energy improvements	4/11/2014 3:47 PM
15	Energy Consultant & Investment Advisor	4/11/2014 10:06 AM
16	As a gov't employee who has used the tool to guide others in assment of solar arrays.	4/11/2014 8:10 AM
17	appraisal	4/10/2014 12:51 PM
18	We use it for ad valorem tax assessment and valuation	4/10/2014 12:04 PM

Q3 Have you used the PV Value® tool for appraisal or assessment purposes?

Answered: 18 Skipped: 0



Answer Choices	Responses	
Appraisal	**11.11%**	2
Assessment	**72.22%**	13
Other	**11.11%**	2
Not applicable	**5.56%**	1
Total		**18**

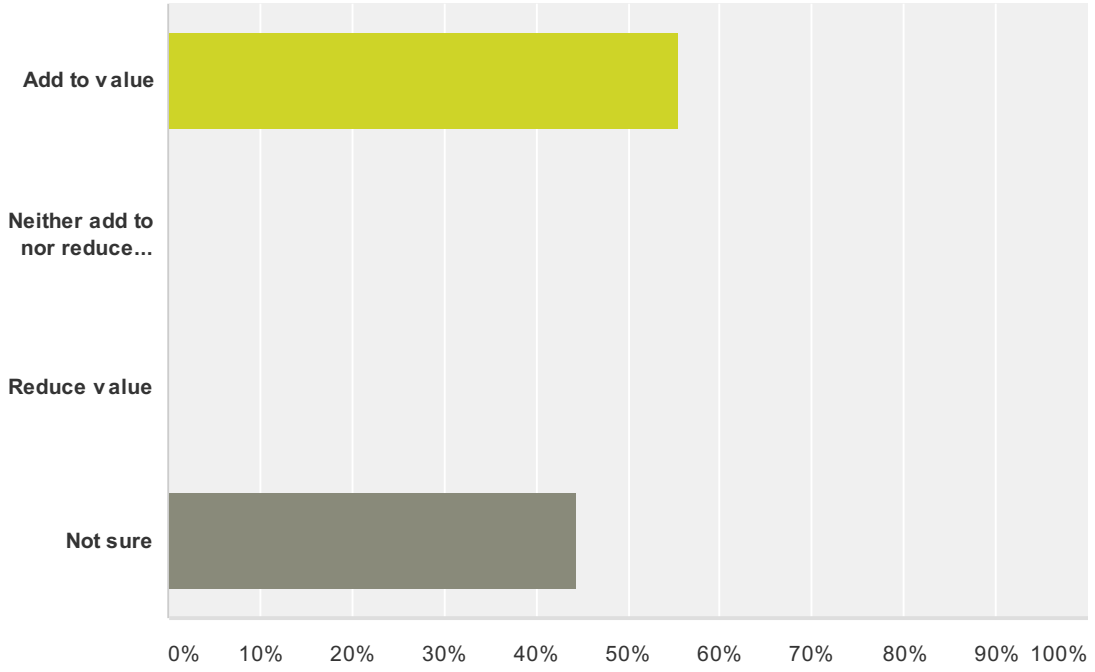
Q4 If "Other," please explain how you have used PV Value®.

Answered: 3 Skipped: 15

#	Responses	Date
1	Educating others. I work on a statewide residential new construction energy efficiency program.	4/25/2014 6:29 AM
2	Have used the tools to examine outcomes of residential solar installations	4/11/2014 3:47 PM
3	not yet	4/10/2014 12:51 PM

Q5 Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?

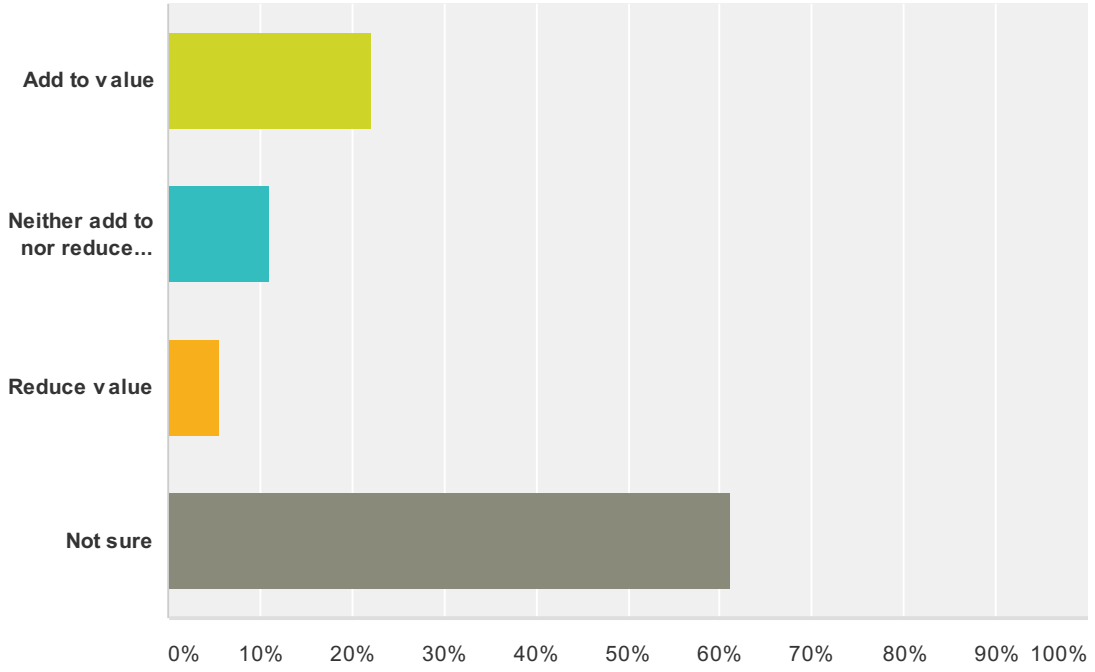
Answered: 18 Skipped: 0



Answer Choices	Responses	
Add to value	**55.56%**	10
Neither add to nor reduce value	**0.00%**	0
Reduce value	**0.00%**	0
Not sure	**44.44%**	8
Total		**18**

Q6 Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?

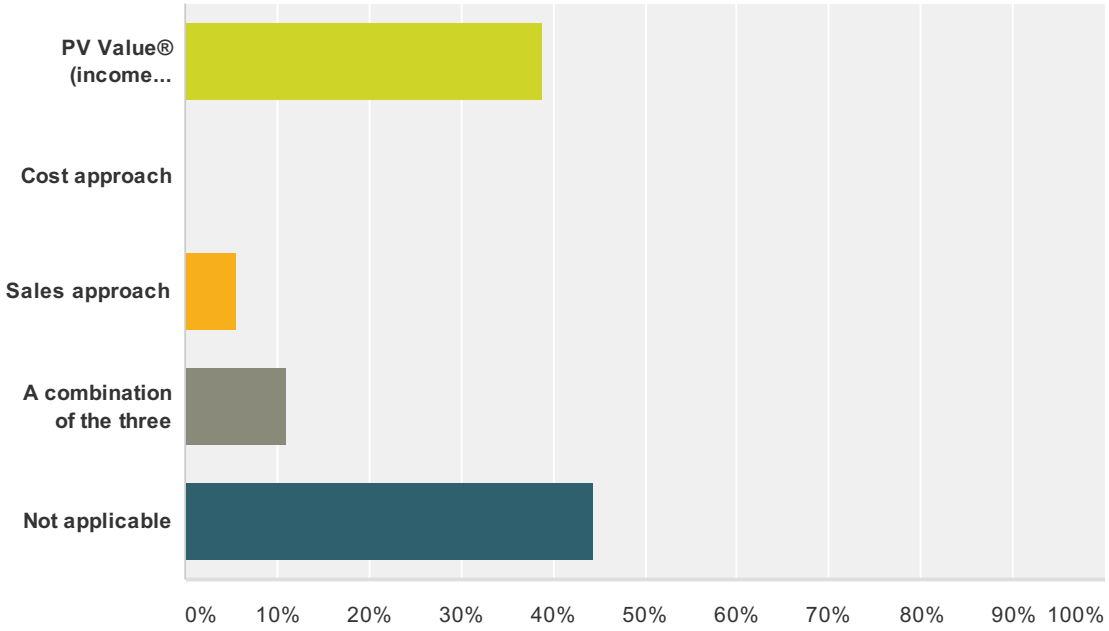
Answered: 18 Skipped: 0



Answer Choices	Responses	
Add to value	**22.22%**	4
Neither add to nor reduce value	**11.11%**	2
Reduce value	**5.56%**	1
Not sure	**61.11%**	11
Total		**18**

Q7 If you are an assessor, do you use PV Value® (income approach), cost approach, sales comparison, or a combination of the three?

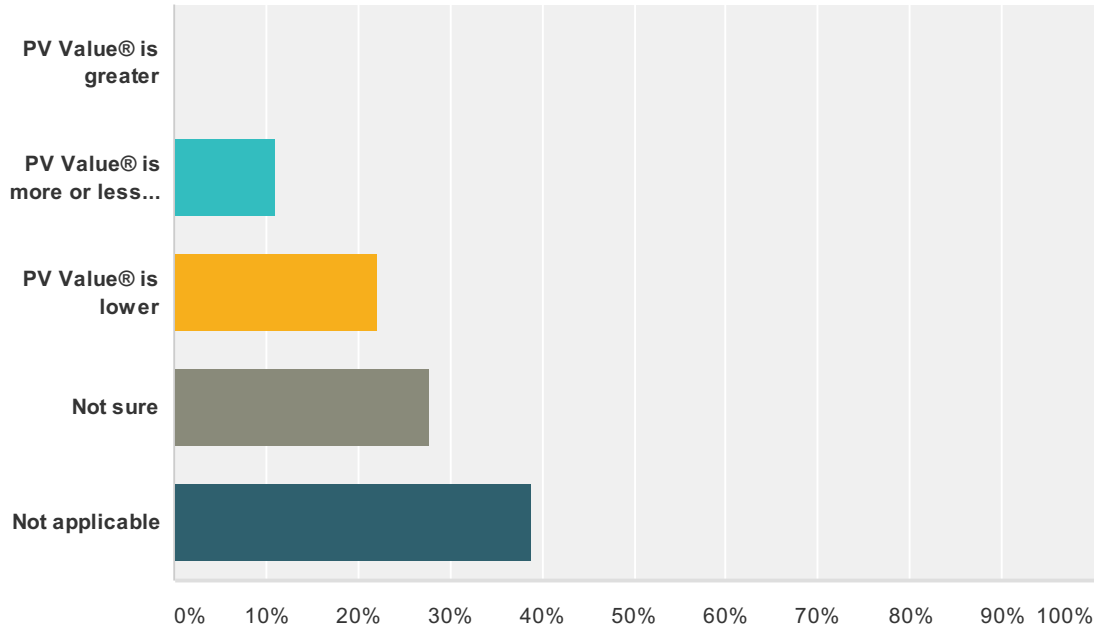
Answered: 18 Skipped: 0



Answer Choices	Responses	
PV Value® (income approach)	**38.89%**	7
Cost approach	**0.00%**	0
Sales approach	**5.56%**	1
A combination of the three	**11.11%**	2
Not applicable	**44.44%**	8
Total		**18**

Q8 If you are an assessor, do you find the value determined using PV Value® to be greater or less than using the cost approach?

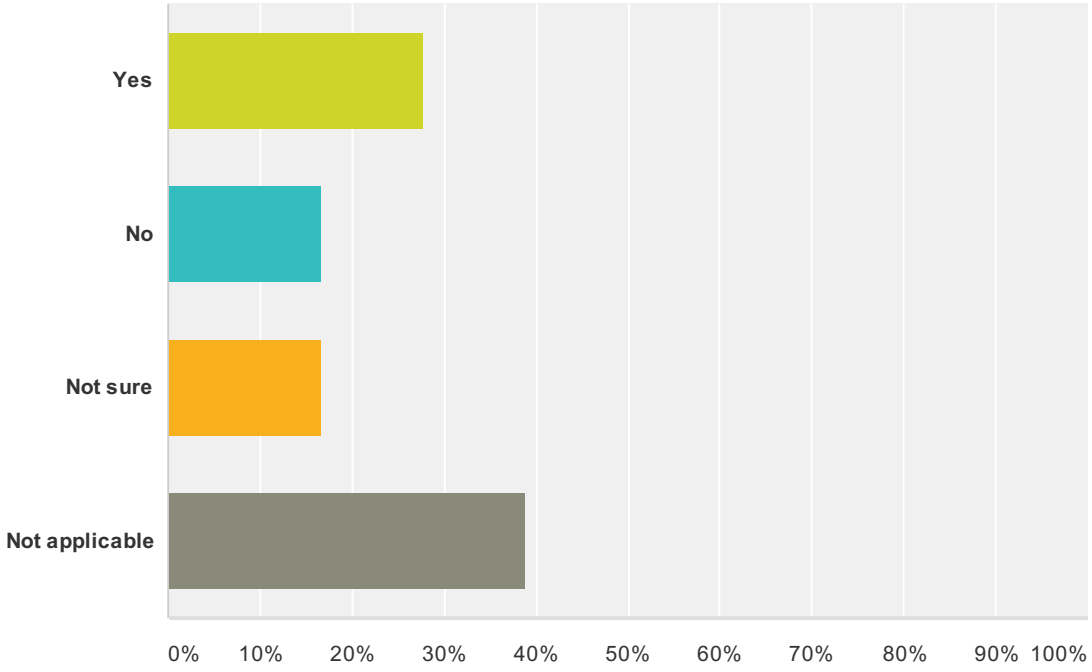
Answered: 18 Skipped: 0



Answer Choices	Responses	
PV Value® is greater	**0.00%**	0
PV Value® is more or less the same	**11.11%**	2
PV Value® is lower	**22.22%**	4
Not sure	**27.78%**	5
Not applicable	**38.89%**	7
Total		**18**

Q9 If your municipality exempts PV systems from assessments, do you still track the added value?

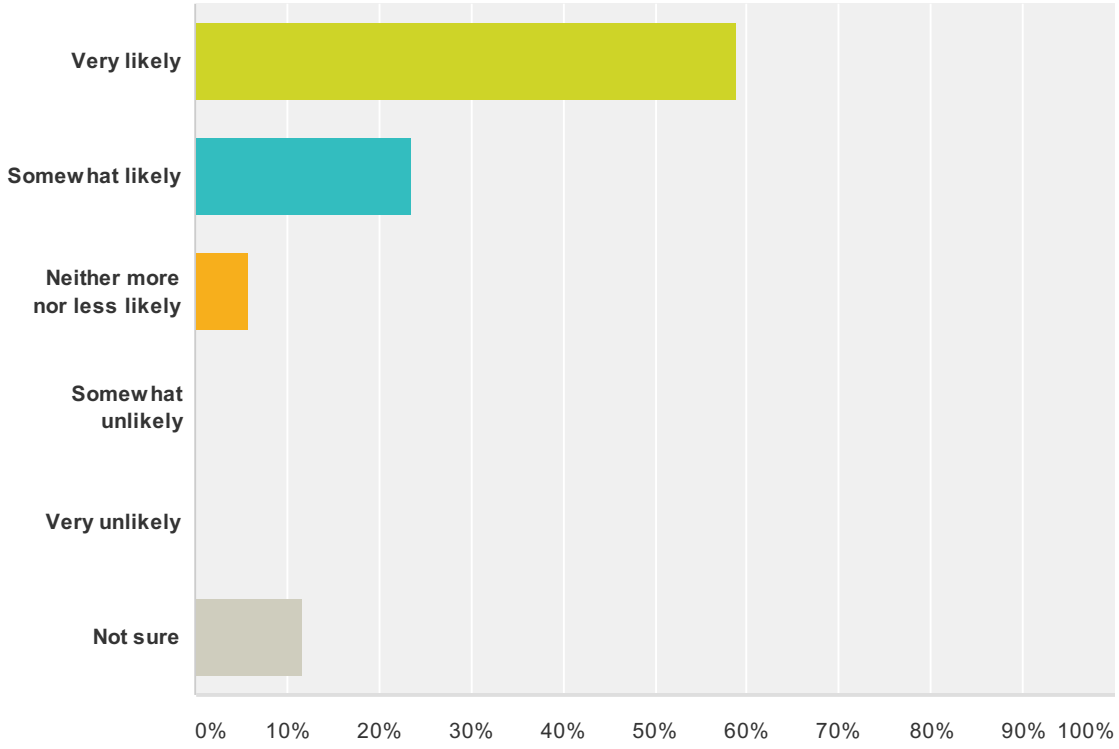
Answered: 18 Skipped: 0



Answer Choices	Responses	
Yes	**27.78%**	5
No	**16.67%**	3
Not sure	**16.67%**	3
Not applicable	**38.89%**	7
Total		**18**

Q10 How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?

Answered: 17 Skipped: 1

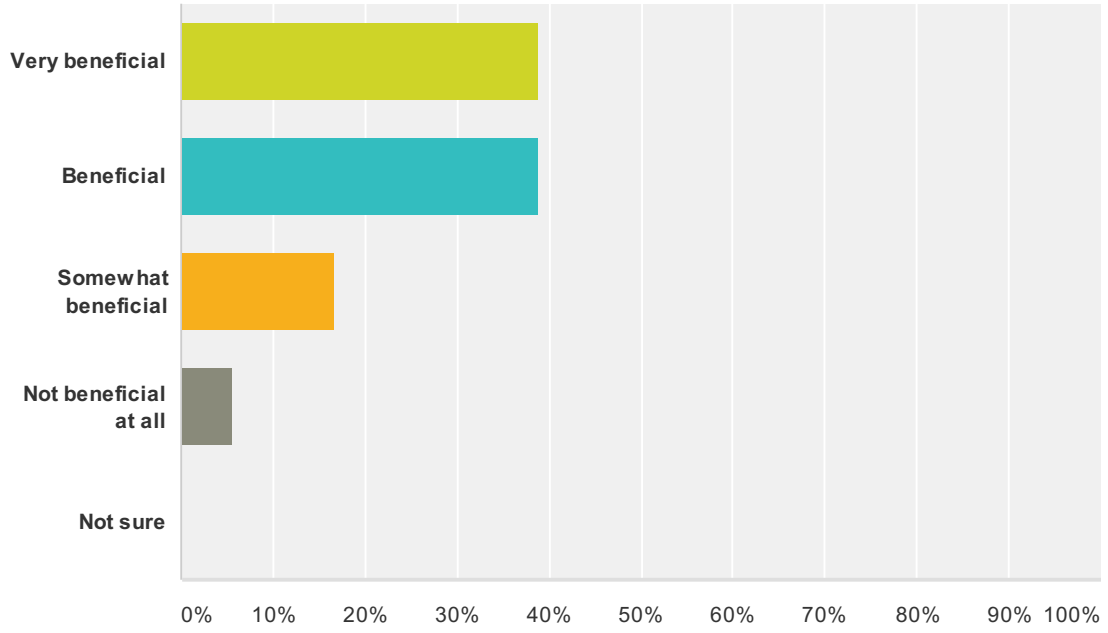


Answer Choices	Responses	
Very likely	**58.82%**	10
Somewhat likely	**23.53%**	4
Neither more nor less likely	**5.88%**	1
Somewhat unlikely	**0.00%**	0
Very unlikely	**0.00%**	0
Not sure	**11.76%**	2

Total	**17**

Q11 How beneficial would access to appraised values of PV systems be for your work?

Answered: 18 Skipped: 0



Answer Choices	Responses	
Very beneficial	**38.89%**	7
Beneficial	**38.89%**	7
Somewhat beneficial	**16.67%**	3
Not beneficial at all	**5.56%**	1
Not sure	**0.00%**	0
Total		**18**

Q12 What would make the PV Value® tool more useful?

Answered: 11 Skipped: 7

#	Responses	Date
1	access and consistent standards (size of systems) we currently have nothing over 150kw so might be mute in future	5/16/2014 7:36 AM
2	This is our state decision to use. At a local level we do not have a choice. was nice just to fill in the blanks & have the value generated for us	5/14/2014 1:06 PM
3	Output utility rate Cents/KWhr averaged over remaining life of the system.	5/14/2014 10:56 AM
4	Just a question. Will the PV spreadsheet be similar when it is web based?	5/14/2014 10:18 AM
5	A quick tutorial.	5/14/2014 9:26 AM
6	Currently PV Systems are exempt from taxation in NJ however I am trying to determine if they do add a measureable value so I can take this into account when I review sales of comparable properties.	4/25/2014 7:13 AM
7	Direct interface with appraisal Green Addendum; Broader database on renewable production benefits and valuation;	4/11/2014 3:47 PM
8	More exporting capabilities for written reports	4/11/2014 10:06 AM
9	A more thorough accounting of O & M expenses and how they are discounted.	4/11/2014 8:10 AM
10	if i did more green appraisal work. My interest is in general as an appraiser, my exposure to green energy has been in land leases from Gov to Developer.	4/10/2014 12:51 PM
11	Generally like it as it is	4/10/2014 12:04 PM

Q1 In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)

Answered: 80 Skipped: 0

#	Responses	Date
1	92262	5/15/2014 3:50 PM
2	30257	5/15/2014 12:33 PM
3	06489	5/15/2014 7:02 AM
4	27560	5/14/2014 5:32 PM
5	94901	5/14/2014 5:07 PM
6	37013	5/14/2014 2:06 PM
7	94550	5/14/2014 1:17 PM
8	95945	5/14/2014 12:08 PM
9	63701	5/14/2014 12:05 PM
10	93921	5/14/2014 11:49 AM
11	85281	5/14/2014 11:12 AM
12	05403	5/14/2014 10:56 AM
13	02072	5/14/2014 10:17 AM
14	94568	5/14/2014 9:57 AM
15	98133	5/14/2014 9:54 AM
16	76548	5/14/2014 9:53 AM
17	90025	5/14/2014 9:40 AM
18	28787	5/14/2014 9:35 AM
19	19952	5/14/2014 9:32 AM
20	56265	5/14/2014 9:24 AM
21	32505	5/14/2014 9:23 AM
22	55406	5/14/2014 9:18 AM
23	98107	5/14/2014 9:15 AM

24	33569	5/14/2014 9:09 AM
25	60053	5/14/2014 9:02 AM
26	95054	5/8/2014 1:13 PM
27	37067	5/3/2014 12:19 AM
28	85034	5/2/2014 3:17 PM
29	92506	4/30/2014 4:15 PM
30	55435	4/29/2014 11:10 AM
31	87109	4/28/2014 11:52 AM
32	63132	4/28/2014 11:49 AM
33	85027	4/28/2014 10:30 AM
34	76016	4/27/2014 11:55 AM
35	21842	4/26/2014 7:47 AM
36	94903	4/26/2014 7:24 AM
37	92660	4/25/2014 10:27 PM
38	94549	4/25/2014 6:03 PM
39	91024	4/25/2014 1:54 PM
40	00000	4/25/2014 1:25 PM
41	85745	4/25/2014 12:00 PM
42	94566	4/25/2014 10:49 AM
43	17527	4/25/2014 6:58 AM
44	06120	4/25/2014 6:42 AM
45	10010	4/25/2014 6:33 AM
46	01220	4/25/2014 6:05 AM
47	20784	4/25/2014 5:01 AM
48	86409	4/24/2014 11:18 PM
49	94588	4/24/2014 9:27 PM
50	28607	4/24/2014 7:55 PM
51	79109	4/24/2014 6:43 PM
52	53704	4/24/2014 6:20 PM
53	93950	4/24/2014 6:14 PM

54	98027	4/24/2014 5:35 PM
55	85225	4/24/2014 5:29 PM
56	85283	4/24/2014 5:25 PM
57	84004	4/24/2014 5:16 PM
58	78704	4/24/2014 5:15 PM
59	80220	4/24/2014 5:13 PM
60	92503	4/24/2014 5:02 PM
61	88061	4/24/2014 5:02 PM
62	95060	4/24/2014 4:56 PM
63	01351	4/22/2014 1:04 PM
64	88001	4/14/2014 4:44 PM
65	98225	4/14/2014 2:53 PM
66	81301	4/11/2014 10:30 PM
67	32920	4/11/2014 9:59 AM
68	28754	4/11/2014 7:45 AM
69	11729	4/10/2014 11:30 PM
70	85085	4/10/2014 4:37 PM
71	48640	4/10/2014 3:18 PM
72	17527	4/10/2014 1:15 PM
73	89014	4/10/2014 1:09 PM
74	84043	4/10/2014 1:03 PM
75	89012	4/10/2014 12:51 PM
76	19067	4/10/2014 12:49 PM
77	11772	4/10/2014 12:43 PM
78	98125	4/10/2014 12:41 PM
79	10014	4/10/2014 12:20 PM
80	37771	4/10/2014 12:16 PM

Q2 Please explain your overall interest in the Photovoltaic (PV) Value® tool.

Answered: 77 Skipped: 3

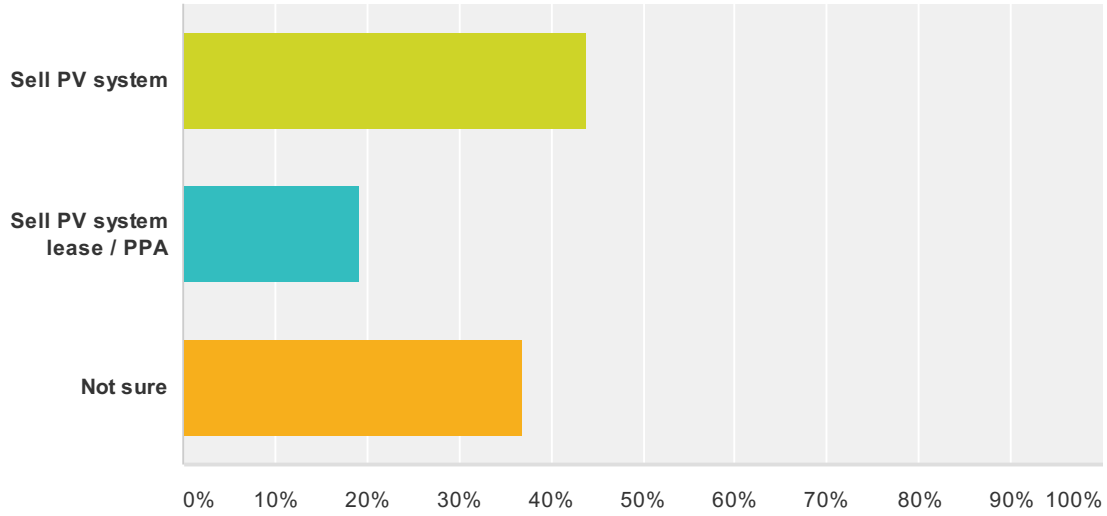
#	Responses	Date
1	Solar Sales	5/15/2014 3:50 PM
2	To help prospects understand benefit of owning PV.	5/15/2014 12:33 PM
3	Estimate the added value of solar PV to a property.	5/15/2014 7:02 AM
4	Academic	5/14/2014 5:32 PM
5	Show potential customer how PV system increases value of property at resale.	5/14/2014 5:07 PM
6	Valuing solar when a client sells their house and for installing solar on new houses.	5/14/2014 2:06 PM
7	I work for a provider	5/14/2014 1:17 PM
8	To demonstrate the added value of a solar system to a home.	5/14/2014 12:08 PM
9	high	5/14/2014 12:05 PM
10	Interested in using to aid in sales of solar.	5/14/2014 11:49 AM
11	To SELL financial benefit of PV to existing commercial customers	5/14/2014 11:12 AM
12	We use it to assess the value of commercial solar installations for tax purposes.	5/14/2014 10:56 AM
13	Sell solar projects residentially and commercially	5/14/2014 10:17 AM
14	PV project development	5/14/2014 9:57 AM
15	I have not used the tool, I will explore it more when I have the time, I was more interested in the technical doc. However, I will provide feedback once I have used the tool.	5/14/2014 9:54 AM
16	PV Installer trying to show potential customers the value of solar on their homes	5/14/2014 9:53 AM
17	1) To estimate the PV system value to the third-party investor/owner of the system. 2) To calculate a PPA rate. 3) To estimate a system cost to the customer.	5/14/2014 9:40 AM
18	great interest	5/14/2014 9:35 AM
19	To show value of PV to potential customers	5/14/2014 9:32 AM
20	My interest is to determine the value of the PV system, with regards to ROI, LCOE, and Grid Parody	5/14/2014 9:23 AM
21	As a tool to better quantify value of PV to interested clients.	5/14/2014 9:18 AM
22	We are selling PV systems to general contractors and green builders who are flipping houses and need to quantify value.	5/14/2014 9:15 AM
23	Provide to APPRAISOR for evaluation of property value	5/14/2014 9:09 AM

24	Apprasal, financial evaluation	5/14/2014 9:02 AM
25	Would like to know more about it and understand its value to our business.	5/8/2014 1:13 PM
26	We finance,EPC, operate PV	5/3/2014 12:19 AM
27	Working with builders to make PV available to buyers by mortgaging cost	5/2/2014 3:17 PM
28	eh	4/30/2014 4:15 PM
29	We use it to so building owners the increase in value of their property after system installations	4/29/2014 11:10 AM
30	We recommend it to our customers so that they can understand the value PV has on the resale of there home.	4/28/2014 11:52 AM
31	identifying what the resale value of a lead's home might be if they decide to install solar - use as a selling tool	4/28/2014 11:49 AM
32	in solar industry	4/28/2014 10:30 AM
33	I am a solar pv contractor	4/27/2014 11:55 AM
34	Used it to assess overall value of purchase	4/26/2014 7:24 AM
35	it is an invaluable tool that establishes a government recognized valuation process needed in regard to IRS Audits, energy property valuation, real property valuation, investment returns, cash flows, income to cost / valuation considerations, etc.	4/25/2014 10:27 PM
36	Interested	4/25/2014 6:03 PM
37	To project future depreciated values of residential PV systems.	4/25/2014 1:54 PM
38	evaluate as an alternate to manual calculation	4/25/2014 1:25 PM
39	BIPV technical advisor for Miasole and Global Solar	4/25/2014 12:00 PM
40	I like it	4/25/2014 10:49 AM
41	Interesting in using it to help financial institutions discover the value of a solar project.	4/25/2014 6:58 AM
42	Info for our files	4/25/2014 6:42 AM
43	reference for client research	4/25/2014 6:33 AM
44	no interest	4/25/2014 6:05 AM
45	Great Program but have not needed to use	4/25/2014 5:01 AM
46	To help customers and financial institutions understand the real value behind solar	4/24/2014 11:18 PM
47	High, use it very often for site evaluation	4/24/2014 9:27 PM
48	Valuation of PV systems when donated to a non-profit	4/24/2014 7:55 PM
49	solar developer	4/24/2014 6:20 PM
50	None	4/24/2014 6:14 PM
51	looking for a value for consulting purposes.	4/24/2014 5:35 PM
52	solar sales person	4/24/2014 5:29 PM

53	Solar sales	4/24/2014 5:25 PM
54	We have been selling and installing Solar PV systems since 2006. We are always on the lookout for good software tools.	4/24/2014 5:16 PM
55	Provide added home value to clients	4/24/2014 5:15 PM
56	I sell solar power and interested in Solar Industry knowledge	4/24/2014 5:13 PM
57	We are PV Integrators	4/24/2014 5:02 PM
58	We are solar installation company. We have been asked about the value of a system when the homeowner wants to sell a home. Our clients have had problems with appraisals.	4/24/2014 5:02 PM
59	Proving equity in a home can be increased with pv	4/24/2014 4:56 PM
60	To provide information to our clients, real estate agents and appraiser on the value of installed PV systems.	4/22/2014 1:04 PM
61	Residential Solar Salesperson	4/14/2014 4:44 PM
62	We're a PV installer and would like home value information for our clients	4/14/2014 2:53 PM
63	involved in a "Solarize" program, and want to find tools to value PV systems	4/11/2014 10:30 PM
64	We are a structured finance firm that uses the tool to estimate FMV buyouts for our TEIs	4/11/2014 9:59 AM
65	We are a PV Installation and Design Co. We have used PV Value as a sales tool to show what the system might be worth in the future.	4/11/2014 7:45 AM
66	It helps me dispel the myth that solar does not increase the value of someone's home, an idea still held by many appraisers today.	4/10/2014 11:30 PM
67	Use as a sales tool to show future value for homeowners interested in adding solar to their home.	4/10/2014 4:37 PM
68	Component of introductory PV course	4/10/2014 3:18 PM
69	It is crucial to what we do!! We need to have the capability to value a solar project in future years.	4/10/2014 1:15 PM
70	I work in PV sales and would like to stay up on how system's are valued for future purchase or sales of homes.	4/10/2014 1:09 PM
71	I would like to be a voice in the solar real estate market. i am an approved instructor for the NAR's green designation.	4/10/2014 1:03 PM
72	work in industry	4/10/2014 12:51 PM
73	I haven't used it yet because I use open office and not Excel...looking forward to the web-based version	4/10/2014 12:49 PM
74	Im a solar installer	4/10/2014 12:43 PM
75	I do financial modeling for the solar industry	4/10/2014 12:41 PM
76	A reference to PV system pricing.	4/10/2014 12:20 PM
77	Photovoltaic installation contractor - use it as a sales tool	4/10/2014 12:16 PM

Q3 Have you used PV Value® to help sell a PV system, or sell a lease / PPA for a PV system?

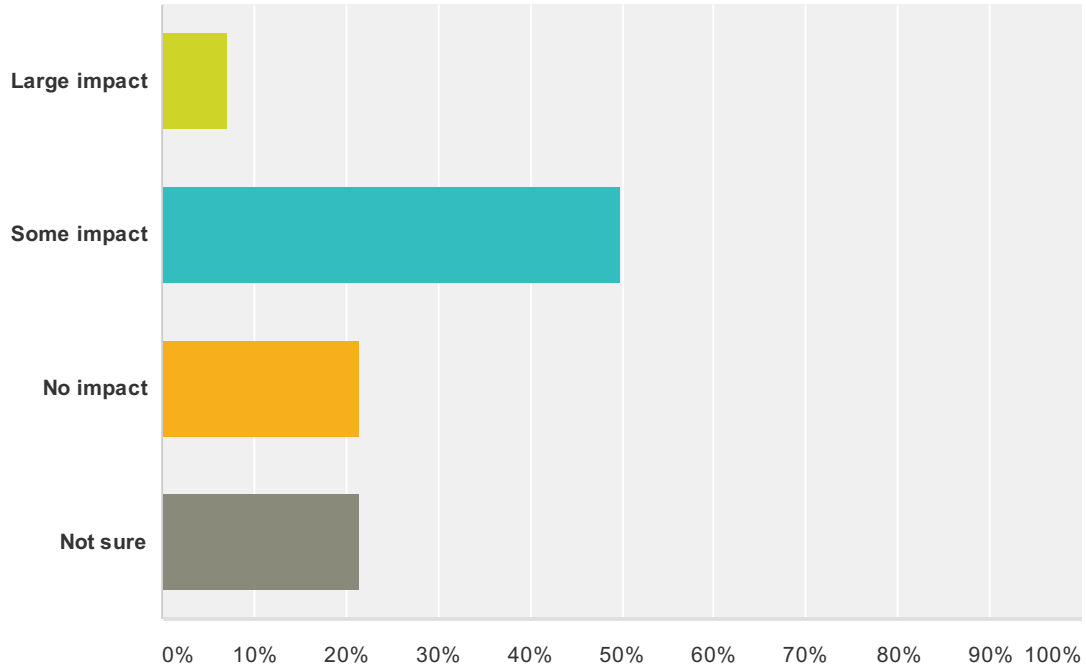
Answered: 73 Skipped: 7



Answer Choices	Responses	
Sell PV system	**43.84%**	32
Sell PV system lease / PPA	**19.18%**	14
Not sure	**36.99%**	27
Total		**73**

Q4 If you have used the PV Value® tool to sell a PV system or a lease/PPA, what impact did the value have on closing the sale?

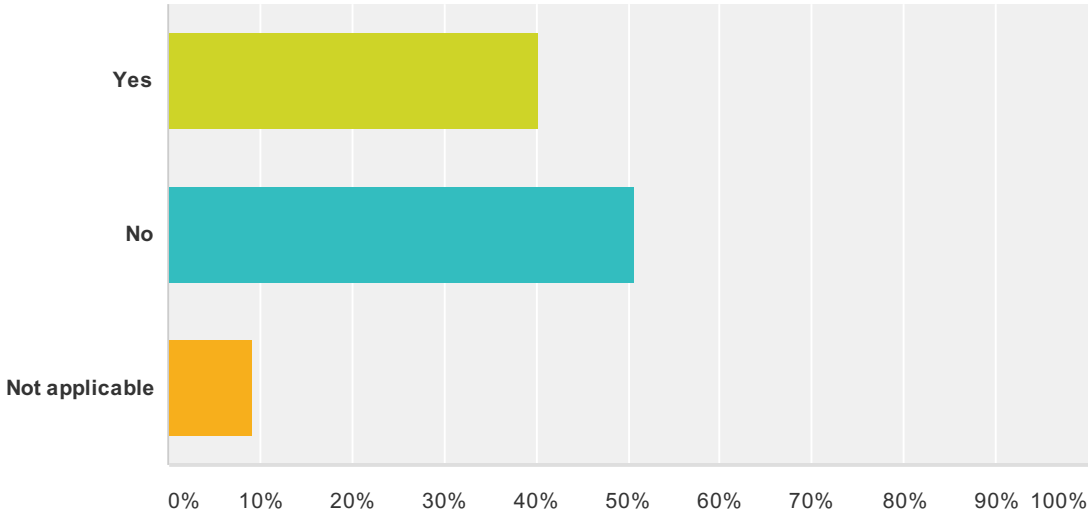
Answered: 70 Skipped: 10



Answer Choices	Responses	
Large impact	**7.14%**	5
Some impact	**50.00%**	35
No impact	**21.43%**	15
Not sure	**21.43%**	15
Total		**70**

Q5 Are you a third-party solar PV provider?

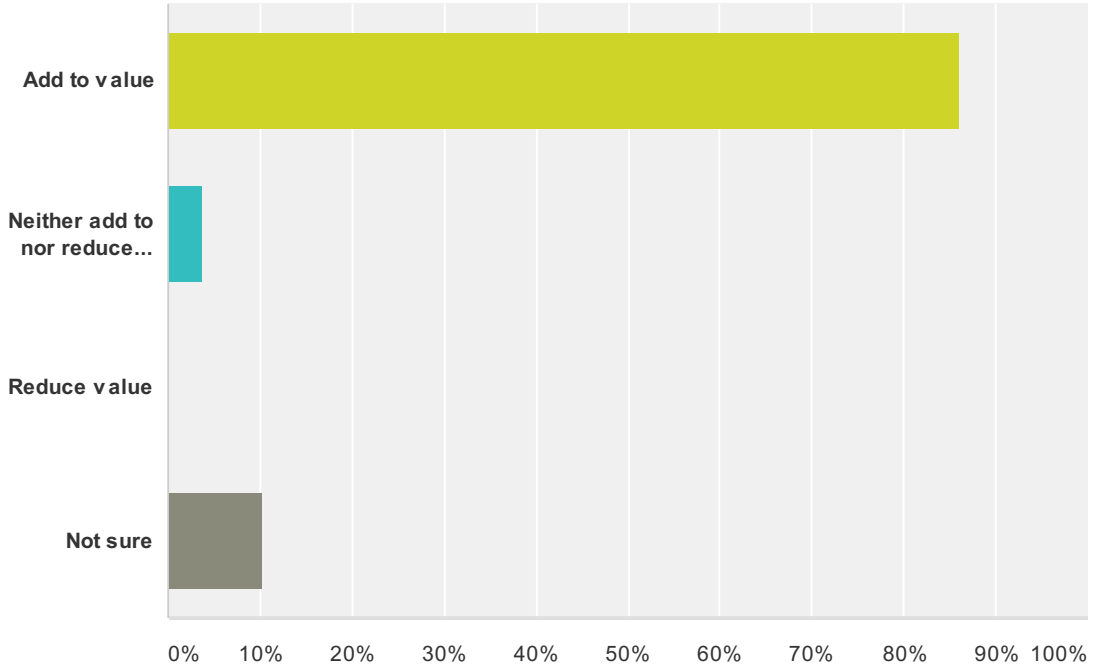
Answered: 77 Skipped: 3



Answer Choices	Responses	
Yes	**40.26%**	31
No	**50.65%**	39
Not applicable	**9.09%**	7
Total		**77**

Q6 Generally, do owned PV systems add to or reduce the value of property in real estate transactions?

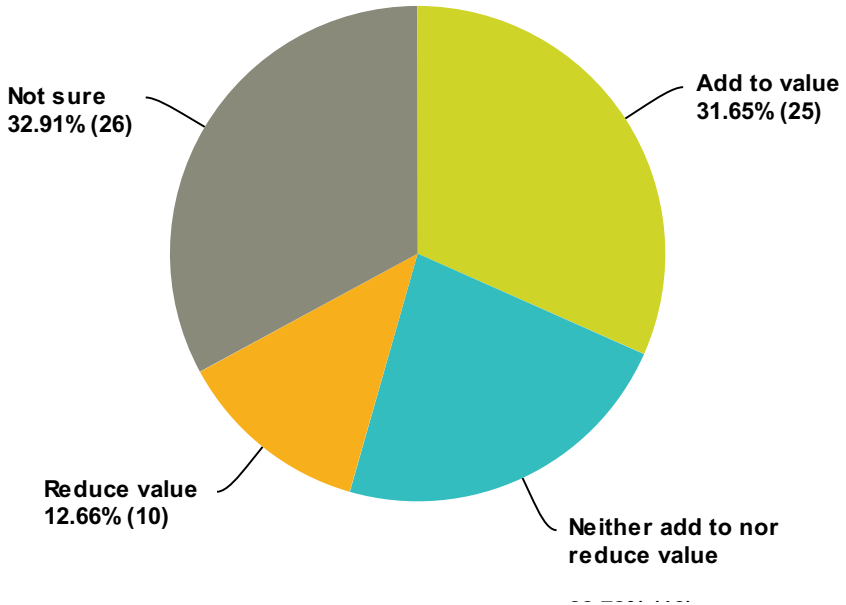
Answered: 79 Skipped: 1



Answer Choices	Responses	
Add to value	**86.08%**	68
Neither add to nor reduce value	**3.80%**	3
Reduce value	**0.00%**	0
Not sure	**10.13%**	8
Total		**79**

Q7 Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?

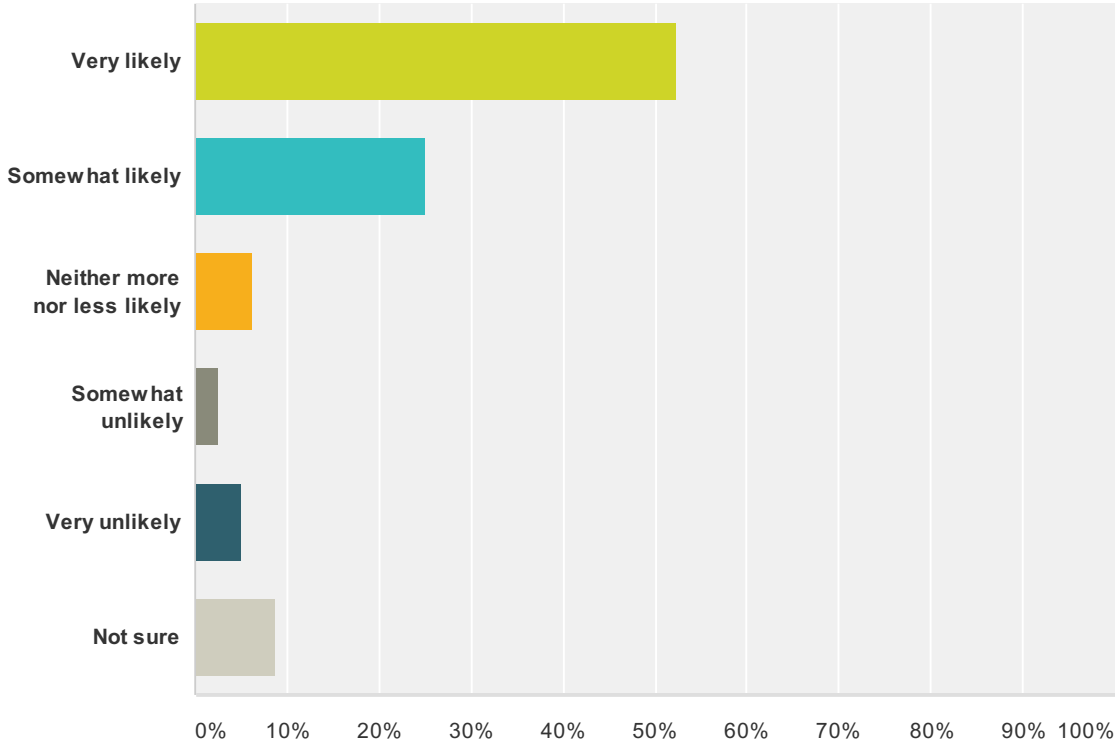
Answered: 79 Skipped: 1



Answer Choices	Responses	
Add to value	31.65%	25
Neither add to nor reduce value	22.78%	18
Reduce value	12.66%	10
Not sure	32.91%	26
Total		79

Q8 How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?

Answered: 80 Skipped: 0

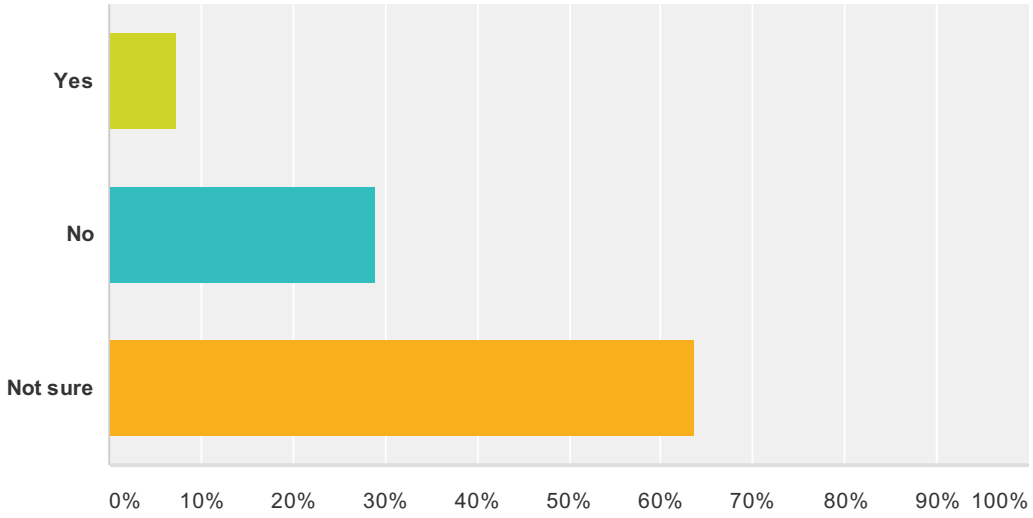


Answer Choices	Responses	
Very likely	**52.50%**	42
Somewhat likely	**25.00%**	20
Neither more nor less likely	**6.25%**	5
Somewhat unlikely	**2.50%**	2
Very unlikely	**5.00%**	4
Not sure	**8.75%**	7

Total	**80**

Q9 If you are a third-party solar PV provider, has this tool been used by an independent appraiser to evaluate the potential fair market value of a PV system undergoing an ownership transfer?

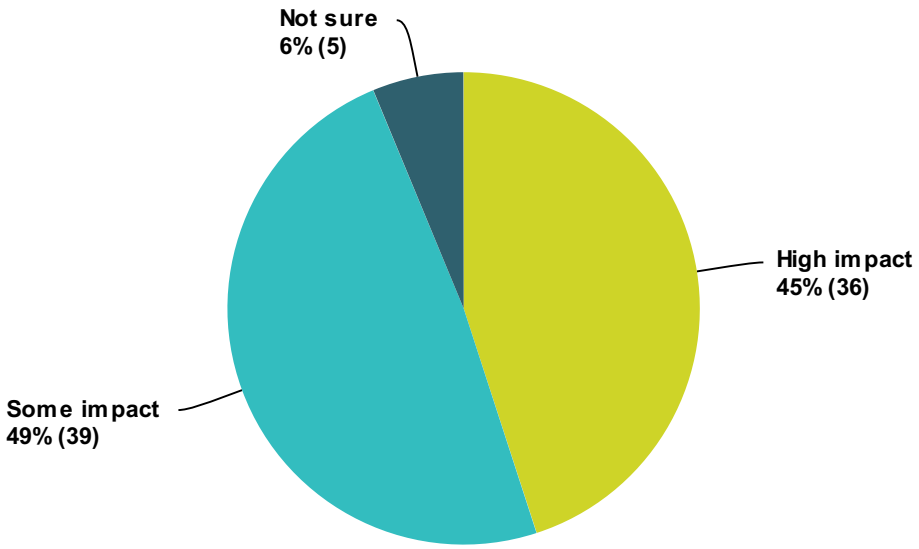
Answered: 69 Skipped: 11



Answer Choices	Responses	
Yes	**7.25%**	5
No	**28.99%**	20
Not sure	**63.77%**	44
Total		**69**

Q10 Do you believe quality impacts the "market value" or "fair market value" of a PV system?

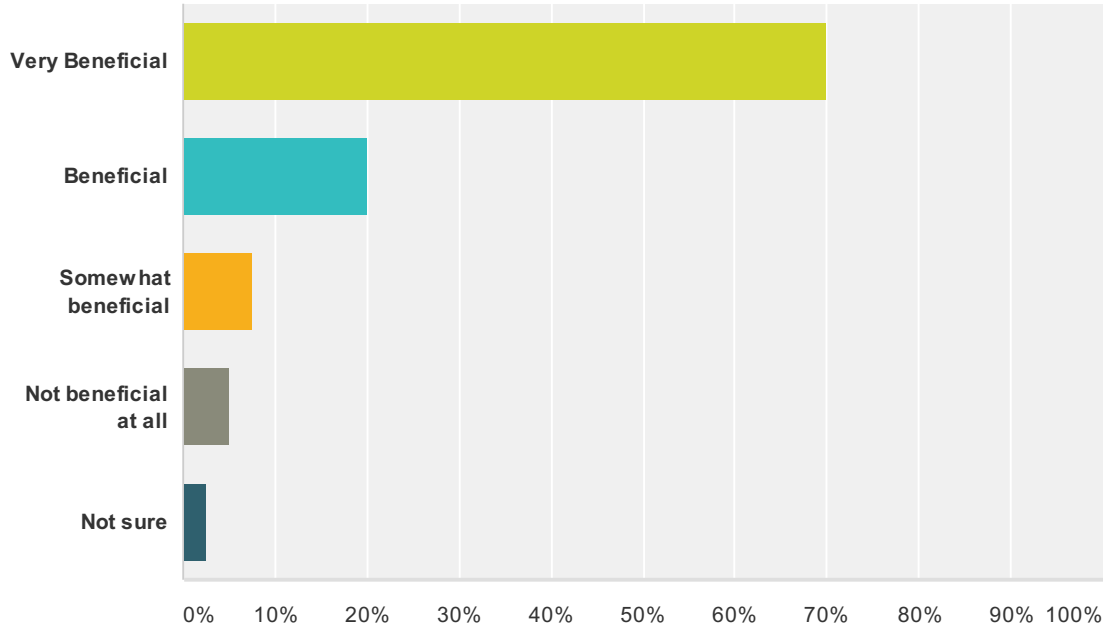
Answered: 80 Skipped: 0



Answer Choices	Responses	
High impact	45%	36
Some impact	49%	39
No impact	0%	0
Not sure	6%	5
Total		80

Q11 How beneficial would access to appraised values of PV systems be to your business?

Answered: 80 Skipped: 0



Answer Choices	Responses	
Very Beneficial	**70.00%**	56
Beneficial	**20.00%**	16
Somewhat beneficial	**7.50%**	6
Not beneficial at all	**5.00%**	4
Not sure	**2.50%**	2
Total Respondents: 80		

Q12 What would make the PV Value® tool more useful?

Answered: 53 Skipped: 27

#	Responses	Date
1	Larger print	5/15/2014 3:50 PM
2	Haven't tried it yet...	5/15/2014 12:33 PM
3	Keep ot in excel or convert it to JAVA.	5/14/2014 5:32 PM
4	Great tool!	5/14/2014 5:07 PM
5	The format was not easy to use.. I could not figure it out.. too complicated	5/14/2014 1:17 PM
6	I have not used this tool yet in my sales presentation. I thought it was only applicable to real estate appraisers.	5/14/2014 12:08 PM
7	Perhaps web version will function. I was unable to get beyond the splash screen, as the tool requires using Excel on a PC or Mac. I am using LibreCalc on a Linux system.	5/14/2014 11:49 AM
8	Allow for "soiling" (snow buildup) in northern areas like PVSyst	5/14/2014 10:56 AM
9	Some legitimacy behind it, it seems to be on its own, not any real strong or hard endorsement anywhere from any widely recognized parties...I feel as though most people question the accuracy and legitimacy of the data and its true impact and I fear that may not occur until more transactions occur and case studies exist...	5/14/2014 10:17 AM
10	So far so good	5/14/2014 9:57 AM
11	recognition of longer warranty and addiitonal solar production associated with microinverters	5/14/2014 9:53 AM
12	Make the production model more transparent and allow for different investor models e.g. partnership-flips, sale-leasebacks, inverted leases. Possibly make two different outputs, one for investors and one for the potential PV customer	5/14/2014 9:40 AM
13	easier interface	5/14/2014 9:35 AM
14	Ability to interface with existing assessed and resale property transaction data sets. A feature that qualifies that data - market valuation, sales transaction, assessed value with dates those valuations were recorded.	5/14/2014 9:18 AM
15	I had to create a spreadsheet of my own because this tool has no means to accurately reflect the production incentive program for WA State in which the PBI and net metering are separate.	5/14/2014 9:15 AM
16	idk	5/14/2014 9:02 AM
17	Need to know more about it first.	5/8/2014 1:13 PM
18	More knowledge of it and acceptance of it by re appraisers, brokers, buyers, sellers, financial institutions and their consultants and advisors	5/3/2014 12:19 AM

19	Reasonable cost approach should be used with new construction or builders will not offer solar to the masses. Buyers lose considerable value when leasing becomes easier for builders than mortgaging the cost. Solar has longer warranties that virtually all other appliances that comes with houses yet it is often undervalued especially when considering that solar more than pays for itself. New homes have always been valued somewhat differently than resales.	5/2/2014 3:17 PM
20	not sure	4/29/2014 11:10 AM
21	easy access for our customers.	4/28/2014 11:52 AM
22	1) clearly define what each of the fields in the Disc Rate Calculation box are 2) make it clear with a "calculate now" button which fields must be entered in order to get the whole spreadsheet to update with all the inputs i've added; for ex. e12 & e13 don't automatically populate; 3) The tool would be MUCH MORE valuable if it didnt show a decrease in the value of the kWh production each year (due I guess to figuring in NPV). While NPV may be a consideration, in reality the homeowner will save way more than what you show in all the out years.	4/28/2014 11:49 AM
23	I have yet to use the tool.	4/27/2014 11:55 AM
24	Dk	4/26/2014 7:24 AM
25	A model that uses all of the following: NPV, Cap Rates, ROI including tax benefits, IRR and MIRR's and compares them to 5 and 10 year T-Bills, bonds issued by utilities, and other investment vehicles would help. Nobody understands solar valuations because this is still a very new business. Using and applying all types of traditional investment criteria will help people relate to the value issue. This is what I do when I sell a system to a tax equity investor or sell a system to an owner. [redacted]	4/25/2014 10:27 PM
26	Maps showing regional averages.	4/25/2014 1:54 PM
27	Not applicable to our needs	4/25/2014 1:25 PM
28	In fact I'm also a Realtor and have been working on a program to inspect PV systems on Residential homes and give a value of the existing installed system to the Buyer or Seller of the home. If you have any additional information concerning this please forward. Thank you [redacted]	4/25/2014 10:49 AM
29	Web-based, and proof of appraisers adopting it for use.	4/25/2014 6:58 AM
30	web based	4/25/2014 6:33 AM
31	nothing	4/25/2014 5:01 AM
32	Making appraisers fully aware of it and any professional affiliations they deal with, the vast majority of appraisers have no idea that exists or how to use it properly	4/24/2014 11:18 PM
33	More variables	4/24/2014 9:27 PM
34	Access to compiled (anonymous) data on appraised values of PV systems	4/24/2014 6:20 PM
35	Please answer my question that I have submitted twice by email and voicemail: How do you Choose the Net Yield Rate for a prepaid system? 30yr? 15? respond to [redacted]	4/24/2014 5:35 PM
36	very good the little I have used it	4/24/2014 5:29 PM
37	The biggest problem the entire industry must overcome is to establish a solar "value base" that is recognized by real estate appraisers and bankers AND home buyers. Being able to compare and project local and national utility rates with the cost of owning solar is an important dimension upon which the industry must continue to focus.	4/24/2014 5:16 PM
38	Integration into proposal generator tool	4/24/2014 5:15 PM

39	Acceptance of this tool byall the property Apprisers out there.	4/24/2014 5:02 PM
40	It would be great to be able to use it on my older version of Excel. I am probably going to be upgrading pretty soon anyway. I do really like the calculation and would like to use it in the future for some our clients but I am not an appraiser and have not had an urgent need for it.	4/24/2014 5:02 PM
41	Webinar trainings and a helpline for home owners to verify value before buying.	4/24/2014 4:56 PM
42	Should have at least the option of factoring in ongoing utility incentives, i.e. PBI's or RECs	4/14/2014 4:44 PM
43	Better correlation to actual market value. The tool seems to calculate the value of the future electricity, not the market value of the system on the home. While future value of the electricity is interesting, what really matters is what people are willing to pay for a home with solar on it. The study from Lawrence Berkeley National Labs shows a much higher real increased home value than this tool, which suggests to me the methodology of this tool is inaccurate. Also, in Washington we have an annual production incentive that cannot be accounted for in this tool. The service this tool is attempting to provide is hugely valuable. Unfortunately, I don't believe it accomplishes the task well enough to be of value currently.	4/14/2014 2:53 PM
44	don't have enough experience with it or other similar tools to address this question.	4/11/2014 10:30 PM
45	More Accurate explanation of base points in the context of solar and how to accurately use the NPV tool at the bottom. Polishing up the Fannie Mae functionality would help as well since it has yet to work correctly on any of our computers. If the inverter warranty matches the module warranty will this negate the O/M cost of replacing the inverter since the system as a whole will be considered scrap? If so, another useful function would be to change the inverter warranty period to match that of the panel warranty period, so as to avoid the 15 year replacement cost.	4/11/2014 7:45 AM
46	A more up-to-date database of Utility Electric Rates. Also, the taxes associated with electricity consumption are also offset by solar, yet that added savings isn't accounted for anywhere.	4/10/2014 11:30 PM
47	If it were used by appraisers for every real estate transaction showing added value to homes it would be EXTREMELY important.	4/10/2014 4:37 PM
48	A consumer freindly report. graphs, etc.	4/10/2014 1:15 PM
49	It could be more user friendly. It is hard to quickly come up with a value.	4/10/2014 1:09 PM
50	mobile application, view of historic data of homes that value was added by viewing the tool.	4/10/2014 1:03 PM
51	not sure	4/10/2014 12:43 PM
52	This tool gives a zero value at 25 years, or at the end of the module warranty, regardless of roof condition. I think roof condition/life is a bigger driver than warranty. Also, your tool does not seem to take overall system price inflation as a factor, even though you input a kWh inflation factor. In addition, the appraisal value starts out in year 0 at a very much reduced value; much less than the recent purchase price. Overall, I find this tool deeply flawed, and I think it represents a hope that such a simple approach will prove accurate. I have a lot more input if you're interested. If you want simple, try a 9% (or your input) value depreciation factor per year, tempered and increased upward by a projected yearly inflation factor. [redacted]	4/10/2014 12:41 PM
53	I would like to see worked out examples of PV Value in different circumstances.	4/10/2014 12:20 PM

Q1 In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)

Answered: 67 Skipped: 0

#	Responses	Date
1	81501	5/15/2014 6:09 PM
2	27613	5/15/2014 9:34 AM
3	06489	5/14/2014 8:43 PM
4	87123	5/14/2014 2:59 PM
5	24015	5/14/2014 2:15 PM
6	95630	5/14/2014 1:53 PM
7	85374	5/14/2014 10:41 AM
8	65401	5/14/2014 10:41 AM
9	98501	5/14/2014 9:42 AM
10	27540	5/14/2014 9:36 AM
11	88061	5/14/2014 9:19 AM
12	75006	5/14/2014 9:16 AM
13	20874	5/14/2014 9:14 AM
14	64138	4/29/2014 10:30 AM
15	60067	4/28/2014 6:37 PM
16	56265	4/28/2014 12:16 PM
17	87114	4/27/2014 10:21 PM
18	02420	4/27/2014 7:01 PM
19	48103	4/26/2014 5:17 AM
20	96707	4/25/2014 7:04 PM
21	02130	4/25/2014 2:40 PM
22	98506	4/25/2014 11:52 AM
23	07645	4/25/2014 10:38 AM

24	80027	4/25/2014 9:09 AM
25	80401	4/25/2014 8:39 AM
26	92563	4/25/2014 8:32 AM
27	98034	4/25/2014 7:59 AM
28	92123	4/25/2014 7:42 AM
29	32934	4/25/2014 4:46 AM
30	70611	4/25/2014 3:43 AM
31	3345	4/25/2014 2:22 AM
32	21666	4/24/2014 8:59 PM
33	92337	4/24/2014 8:32 PM
34	89052	4/24/2014 7:57 PM
35	33914	4/24/2014 7:49 PM
36	97322	4/24/2014 6:33 PM
37	85335	4/24/2014 6:16 PM
38	18036	4/24/2014 6:07 PM
39	63005	4/24/2014 5:47 PM
40	80129	4/24/2014 5:32 PM
41	32750	4/24/2014 5:14 PM
42	80120	4/24/2014 5:05 PM
43	33569	4/24/2014 5:03 PM
44	33414	4/24/2014 5:00 PM
45	85743	4/24/2014 4:57 PM
46	21144	4/22/2014 7:18 PM
47	43950	4/21/2014 9:27 AM
48	72756	4/17/2014 12:42 AM
49	97232	4/13/2014 9:00 PM
50	75075	4/13/2014 5:13 PM
51	96740	4/12/2014 8:46 PM
52	85383	4/12/2014 7:38 PM
53	92880	4/12/2014 11:53 AM

54	85286	4/11/2014 10:34 AM
55	88007	4/11/2014 5:35 AM
56	06516	4/10/2014 6:41 PM
57	04937	4/10/2014 4:13 PM
58	87114	4/10/2014 4:04 PM
59	93551	4/10/2014 3:47 PM
60	85085	4/10/2014 1:26 PM
61	79714	4/10/2014 12:52 PM
62	03278	4/10/2014 12:45 PM
63	92029	4/10/2014 12:36 PM
64	22627	4/10/2014 12:35 PM
65	97211	4/10/2014 12:25 PM
66	63129	4/10/2014 12:19 PM
67	92557	4/10/2014 12:15 PM

Q2 Please explain your overall interest in the Photovoltaic (PV) Value tool.

Answered: 61 Skipped: 6

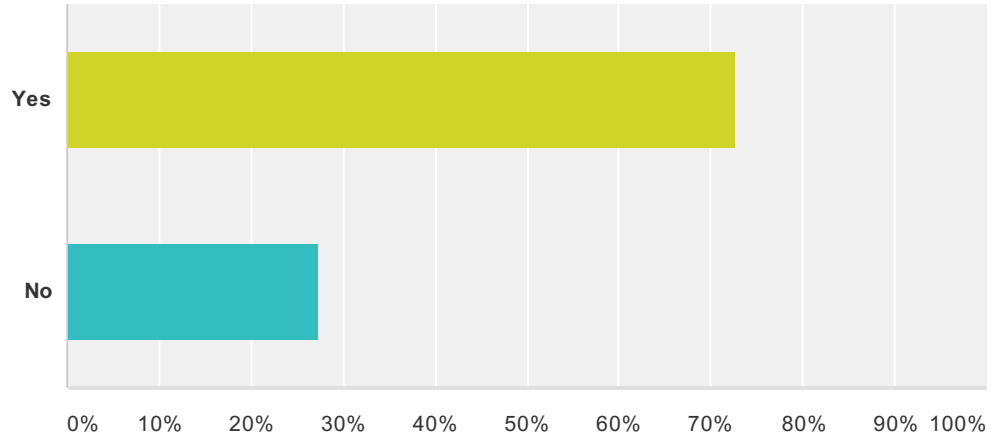
#	Responses	Date
1	I am extremely interested in it so I can know how valuable my system is.	5/15/2014 6:09 PM
2	I used it when sizing my PV system.	5/15/2014 9:34 AM
3	Assistance valuing our PV solar system for the sale of our house.	5/14/2014 8:43 PM
4	Gain understanding of how a PV system adds value	5/14/2014 2:59 PM
5	To run some numbers and not have to trust figures from salespeople	5/14/2014 1:53 PM
6	sales	5/14/2014 10:41 AM
7	Education	5/14/2014 10:41 AM
8	Discussions about home valuation with neighbors and friends interested in real estate.	5/14/2014 9:42 AM
9	Homeowner	5/14/2014 9:36 AM
10	wanted to get honest valuation on increased value to property	5/14/2014 9:19 AM
11	Trying to use hard numbers to help convince family and friends of the monetary value of PV.	5/14/2014 9:16 AM
12	In the process of installing a PV system and answered as we owned it.	5/14/2014 9:14 AM
13	Adding home value effect of installing solar a critical part of the economic justification. Curious as to how this tool is estimating the value increase.	4/28/2014 6:37 PM
14	A tool to help evaluate solar for projects	4/28/2014 12:16 PM
15	selling house with PV system	4/27/2014 10:21 PM
16	Incompatible with my Microsoft Office 2008. (requires use of macros not available with this version)	4/27/2014 7:01 PM
17	To calculate current and future value of installed PV systems and the total additional value it places on a home for purposes of resale.	4/25/2014 7:04 PM
18	not sure	4/25/2014 2:40 PM
19	We were trying to refinance our home and the appraisal came in low, partly because they valued our PV system as very low ($3500 for a 3 kW system that we paid $20K for less than a year earlier).	4/25/2014 11:52 AM
20	Work in the PV Financing Industry	4/25/2014 10:38 AM
21	i downloaded it for my consulting work	4/25/2014 9:09 AM
22	Professional interest in evaluating PV systems	4/25/2014 8:39 AM

23	High- I want to understand the value a system will have in reselling a home	4/25/2014 8:32 AM
24	I currently own two (2) dual-axis, pole-mounted systems (6kW total power output, and need a value estimation tool.	4/25/2014 7:59 AM
25	Owner of a system trying to get a proper appraisal. First appraiser would not use your tool. Second one hopefully will ?	4/25/2014 4:46 AM
26	Research before I purchase a system	4/25/2014 3:43 AM
27	Calculate ROI and payback on options	4/25/2014 2:22 AM
28	Be more informed about Pv systems and technology impacts on property values	4/24/2014 8:59 PM
29	the appraiser gave my system a LOW value. I wanted to give him a tool fro a "Fair" value of my system.	4/24/2014 8:32 PM
30	Track the value my PV system adds to my home.	4/24/2014 7:57 PM
31	Great evaluation tool to determine if solar will be worthwhile	4/24/2014 7:49 PM
32	As a homeowner, I seek to independently predict the yearly production of my leased solar system, and to get some idea of the impact on my home's value.	4/24/2014 6:33 PM
33	Research	4/24/2014 6:16 PM
34	At some point in the next 10-15 years, we'll no longer be able to take care of this house and land. At that point, we'll need to come to a realistic assessment of its value. The PV Value Tool will be an important part of that assessment.	4/24/2014 6:07 PM
35	Understanding how much value was added to my home as a result of installing solar.	4/24/2014 5:47 PM
36	We own an 8.28 KW system.	4/24/2014 5:32 PM
37	Strongly interested	4/24/2014 5:14 PM
38	Find out effect of PV on home value	4/24/2014 5:05 PM
39	Calculating what side of my roof (east or west) to put panels on.	4/24/2014 5:03 PM
40	Homeowner, that installed a 11.3kw system with battery backup and now putting our home on the market to sell and want some form of value placed on the system. We are having difficulties finding an appraiser with any type of knowledge in valuating our home with this system.	4/24/2014 5:00 PM
41	Estimating value added to my residence	4/24/2014 4:57 PM
42	validation of information provided by solar company sales persons.	4/22/2014 7:18 PM
43	Learning more on how to promote PV solar	4/21/2014 9:27 AM
44	need to know what the value to my home is.	4/17/2014 12:42 AM
45	I am interested in purchasing from SunRun at fair market value after five years per my contract w/ Sun Run. I want to expand my system to cover my electric car -Chevy Volt I purchased recently. I need to own the system in order to do that.	4/13/2014 9:00 PM
46	Needed help in estimating and understanding what size array I would need.	4/13/2014 5:13 PM
47	PVs to me are the most environmentally friendly renewable and sustainable and affordable electricity sources -- especially if installed with battery, so that the system can be operated at maximum "self consumption" percentage.	4/12/2014 8:46 PM
48	Would like to use this tool to determine the viability of solar at my home.	4/12/2014 7:38 PM

49	Using it to determine the value of my property	4/12/2014 11:53 AM
50	This is a very essential tool for home owners who have installed PV systems.	4/11/2014 10:34 AM
51	as an aid for selling home.	4/11/2014 5:35 AM
52	Prior to deciding to lease or purchase a PV grid tied sys.I wanted to know how system would be apprased in the future.	4/10/2014 6:41 PM
53	I have solar and am interested in the data	4/10/2014 4:04 PM
54	We plan to sell our home and needed an estimate of the added value for our solar installation.	4/10/2014 1:26 PM
55	Used it estimate how much value the panels I added to my house when I sold it.	4/10/2014 12:52 PM
56	We were considering the purchase of PV system for net metering at this home and for a family home in 01944 zipcode.	4/10/2014 12:45 PM
57	I am interested in purchasing a PV system, but since I will probably selling my home within the next 3-5 years was concerned about the value added by a PV system to the overall resale value of my home. Although the tool appears to be very useful, it is not used by appraisers in my area. In my area they typically increase the appraised value of a home by at most $5,000 for a owner owned PV system. In addition, a leased solar system is currently creating difficulties and delays in home sale escrows. For those reasons, I have reluctantly chosen to not install a PV system.	4/10/2014 12:36 PM
58	looking to corroborate my own financial modeling projections with regards to the 7kW solar PV system i had installed	4/10/2014 12:35 PM
59	i provide free solar advising to builders and new home buyers and a tool that shows the investment value of a solar energy system at time of purchase would be valuable	4/10/2014 12:25 PM
60	I might be interested in it for my house.	4/10/2014 12:19 PM
61	solar valuation	4/10/2014 12:15 PM

Q3 Do you currently own a solar PV system?

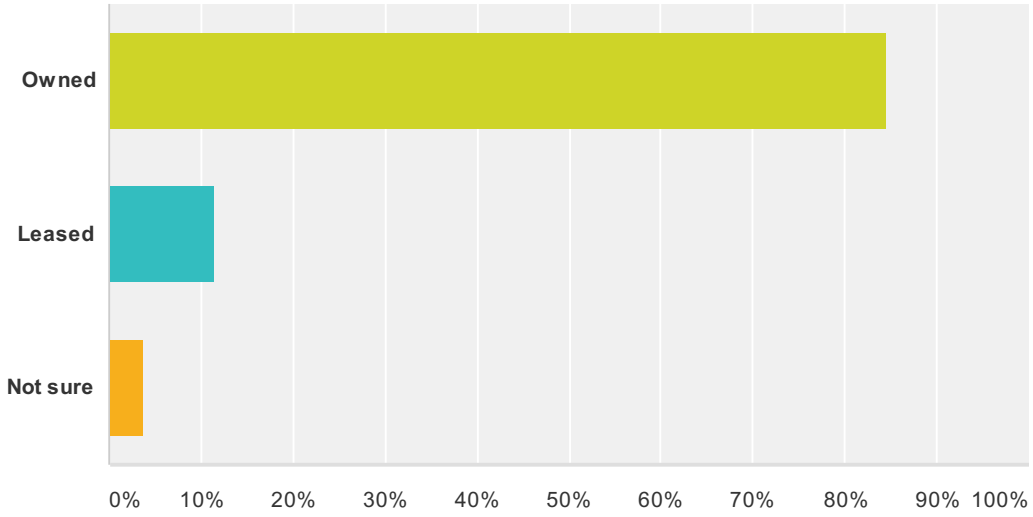
Answered: 66 Skipped: 1



Answer Choices	Responses	
Yes	**72.73%**	48
No	**27.27%**	18
Total		**66**

Q4 If "Yes," is it an owned PV system or a leased PV system?

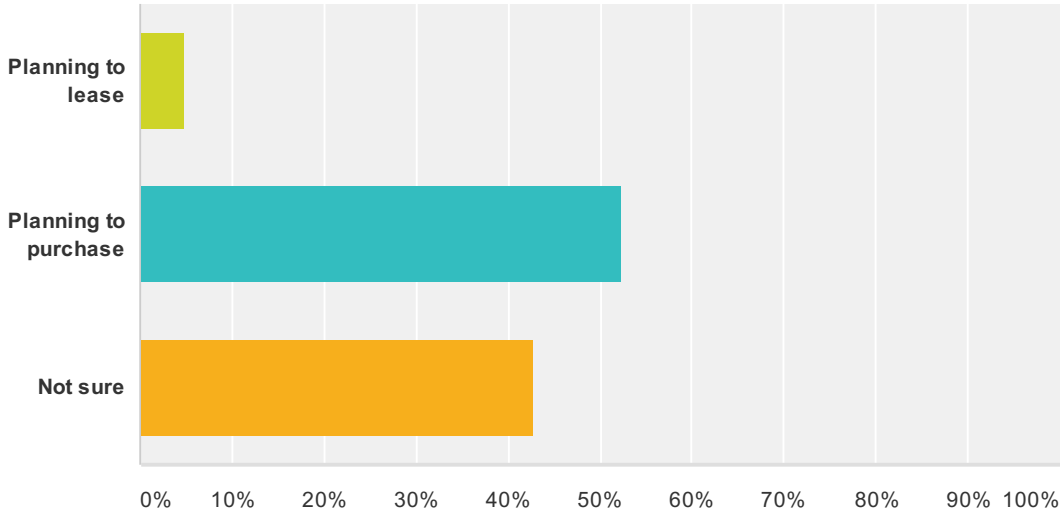
Answered: 52 Skipped: 15



Answer Choices	Responses	
Owned	**84.62%**	44
Leased	**11.54%**	6
Not sure	**3.85%**	2
Total		**52**

Q5 If "No," are you planning on leasing or purchasing a PV system in the future?

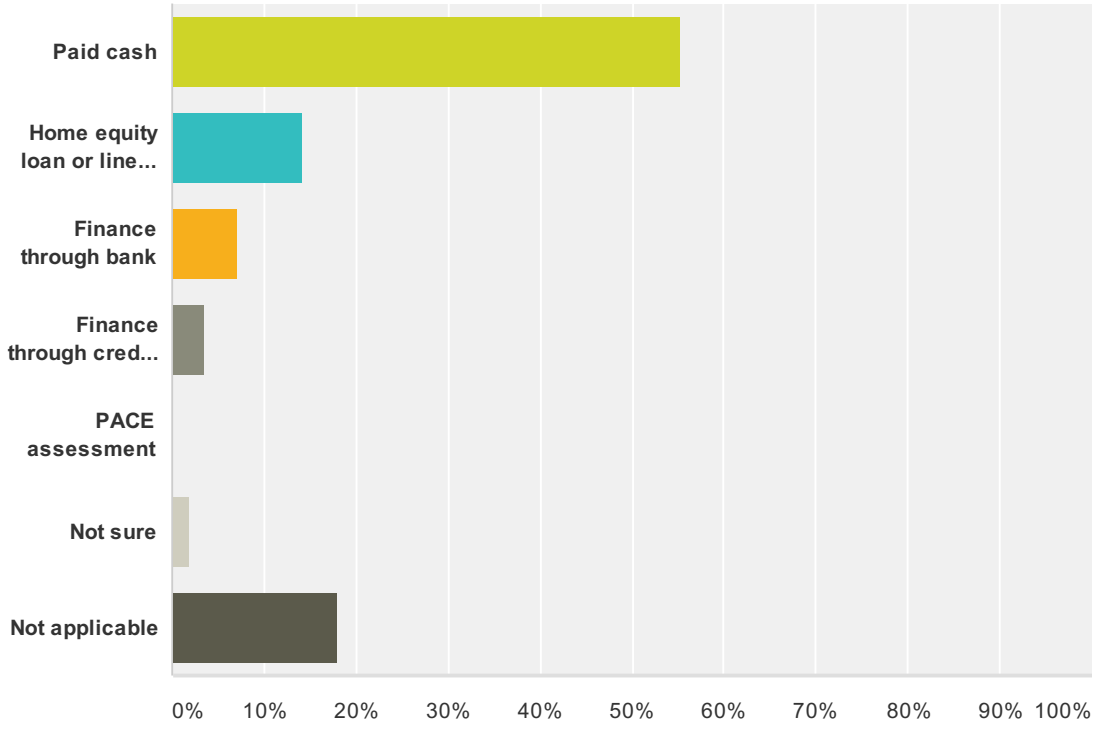
Answered: 21 Skipped: 46



Answer Choices	Responses	
Planning to lease	**4.76%**	1
Planning to purchase	**52.38%**	11
Not sure	**42.86%**	9
Total		**21**

Q6 If you own a PV system, did you pay cash or finance the PV system (independent lender, cash-out refinance, PACE assessment)?

Answered: 56 Skipped: 11

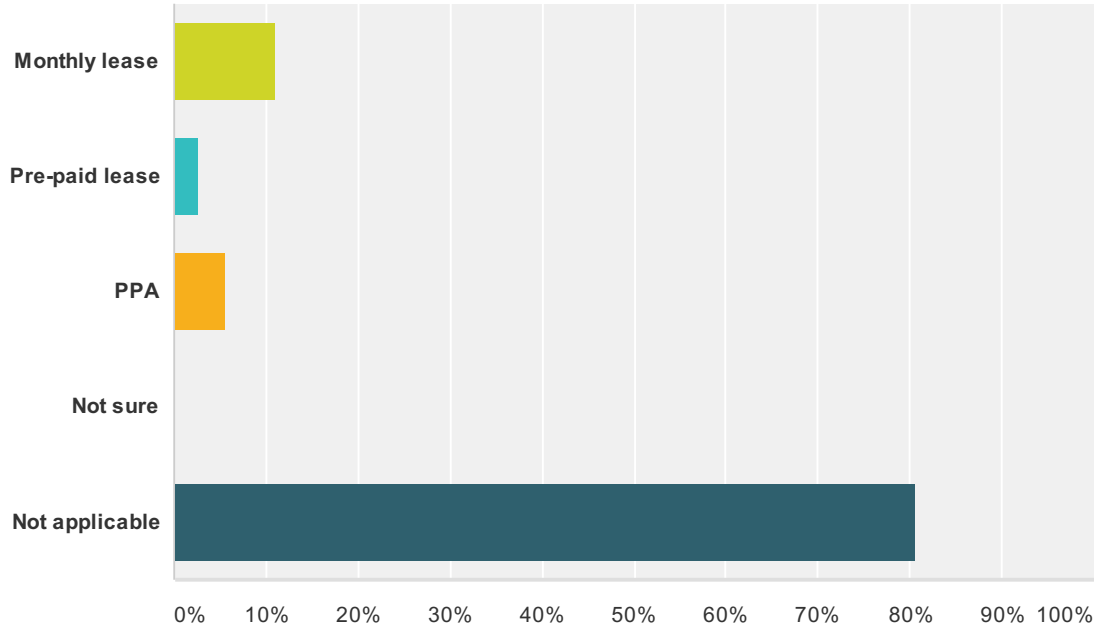


Answer Choices	Responses	
Paid cash	**55.36%**	31
Home equity loan or line of credit	**14.29%**	8
Finance through bank	**7.14%**	4
Finance through credit union	**3.57%**	2
PACE assessment	**0.00%**	0

Not sure	**1.79%**	1
Not applicable	**17.86%**	10
Total		**56**

Q7 If you have leased your PV system, do you have a monthly lease, pre-paid lease, or Power Purchase Agreement (PPA)?

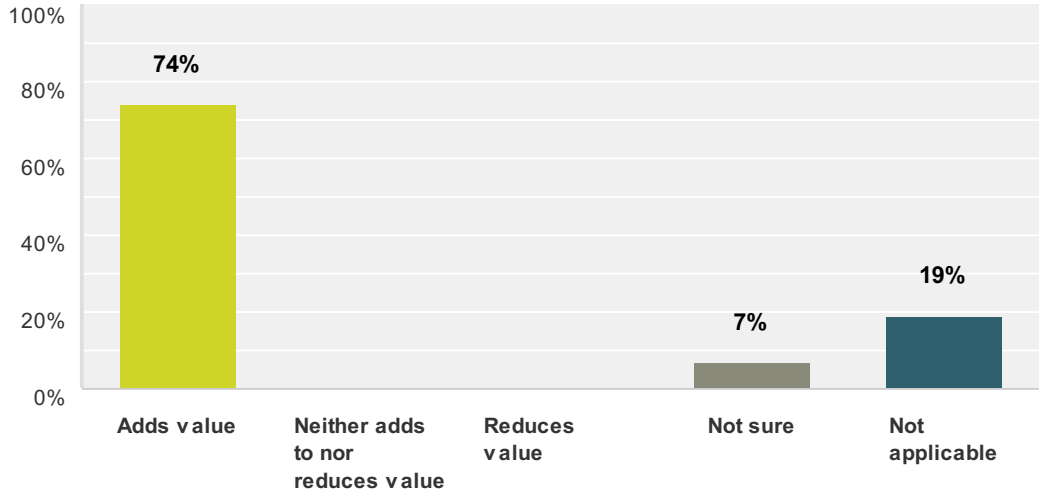
Answered: 36 Skipped: 31



Answer Choices	Responses	
Monthly lease	**11.11%**	4
Pre-paid lease	**2.78%**	1
PPA	**5.56%**	2
Not sure	**0.00%**	0
Not applicable	**80.56%**	29
Total		**36**

Q8 If you own your PV system, do you believe it adds value to your home?

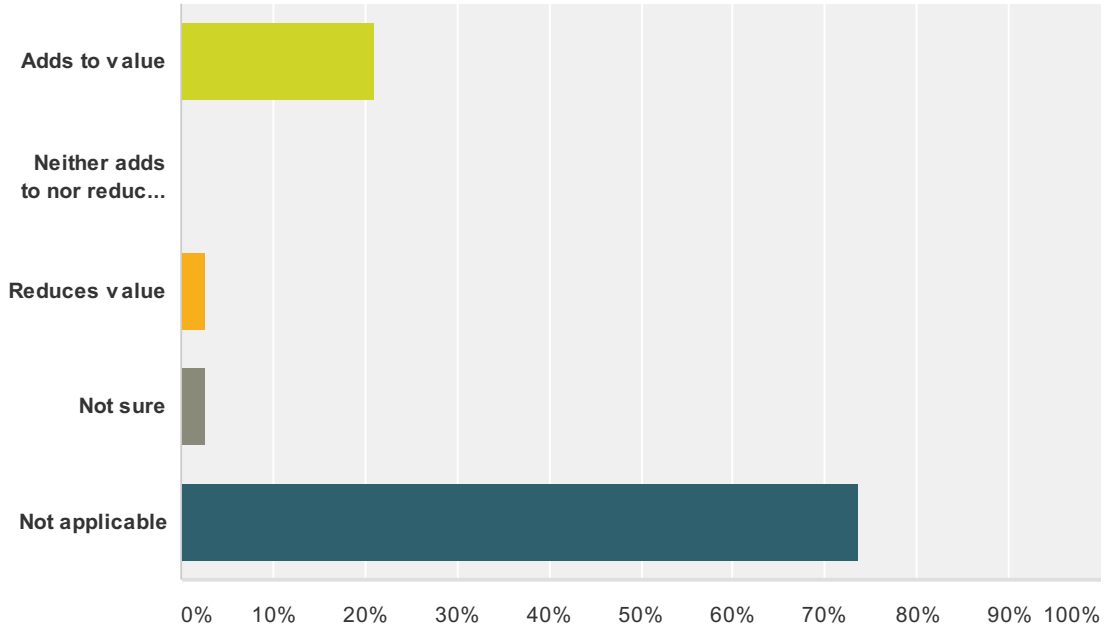
Answered: 58 Skipped: 9



Answer Choices	Responses	
Adds value	74%	43
Neither adds to nor reduces value	0%	0
Reduces value	0%	0
Not sure	7%	4
Not applicable	19%	11
Total		58

Q9 If you have leased your PV system, do you believe your PV system adds value to your home?

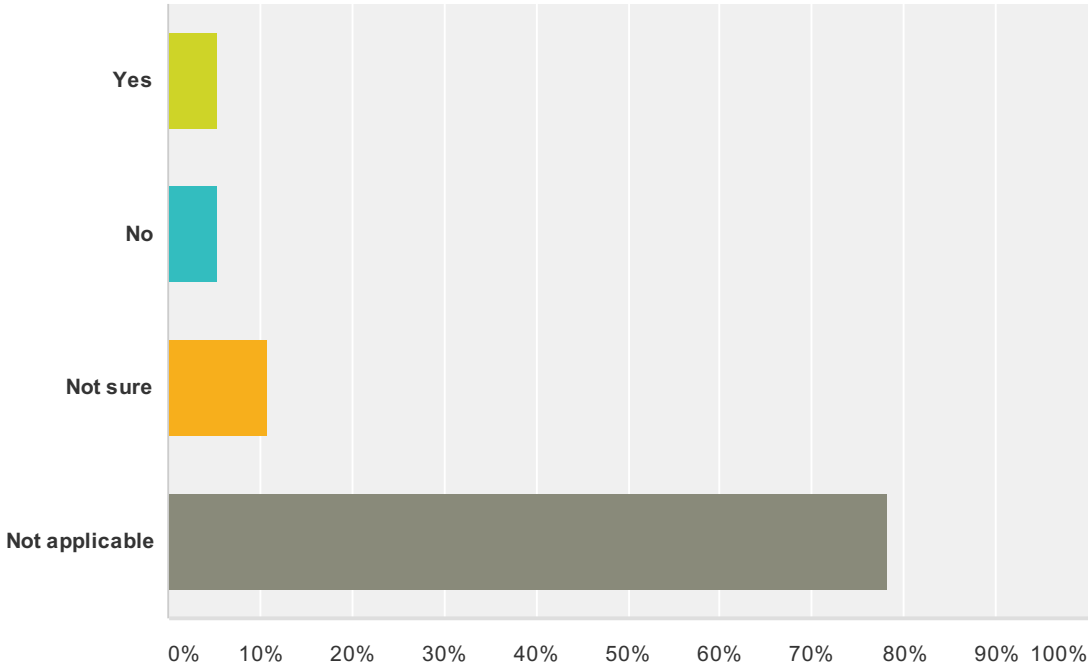
Answered: 38 Skipped: 29



Answer Choices	Responses	
Adds to value	**21.05%**	8
Neither adds to nor reduces value	**0.00%**	0
Reduces value	**2.63%**	1
Not sure	**2.63%**	1
Not applicable	**73.68%**	28
Total		**38**

Q10 If your leased PV system has an early buyout clause, do you plan to use it?

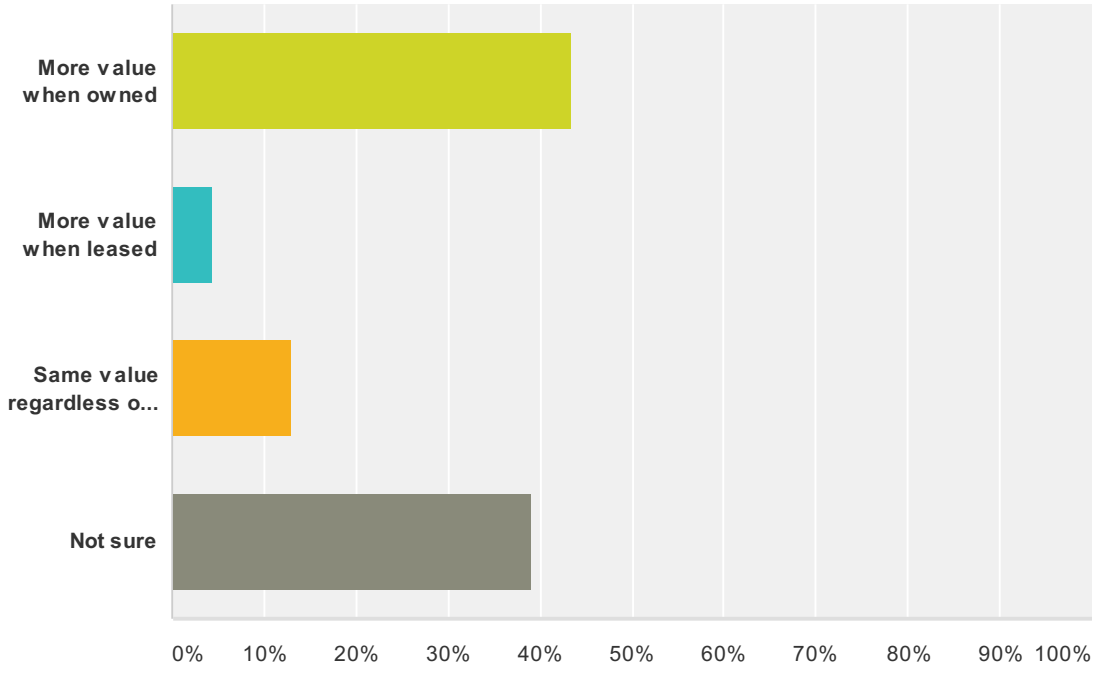
Answered: 37 Skipped: 30



Answer Choices	Responses	
Yes	**5.41%**	2
No	**5.41%**	2
Not sure	**10.81%**	4
Not applicable	**78.38%**	29
Total		**37**

Q11 If you plan to, or have already exercised an early buyout option, do you believe the PV system adds more value during the lease period or after it is purchased?

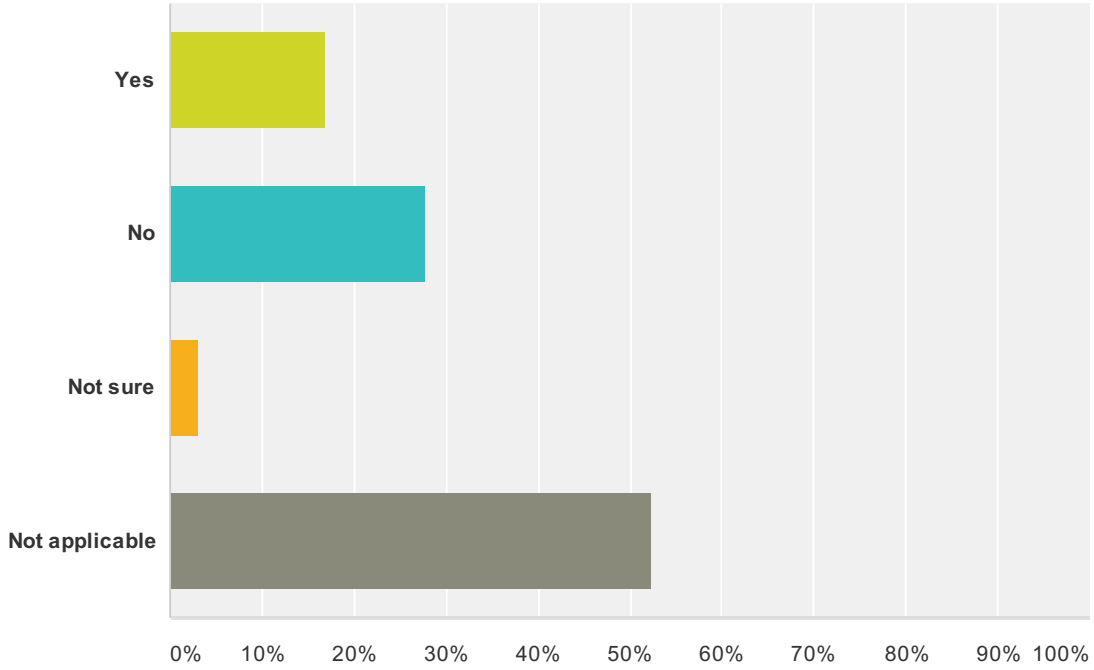
Answered: 23 Skipped: 44



Answer Choices	Responses	
More value when owned	**43.48%**	10
More value when leased	**4.35%**	1
Same value regardless of ownership	**13.04%**	3
Not sure	**39.13%**	9
Total		**23**

Q12 After hearing about the PV Value® tool, did you give it to a real estate agent to develop a 'market analysis' before listing your home for sale?

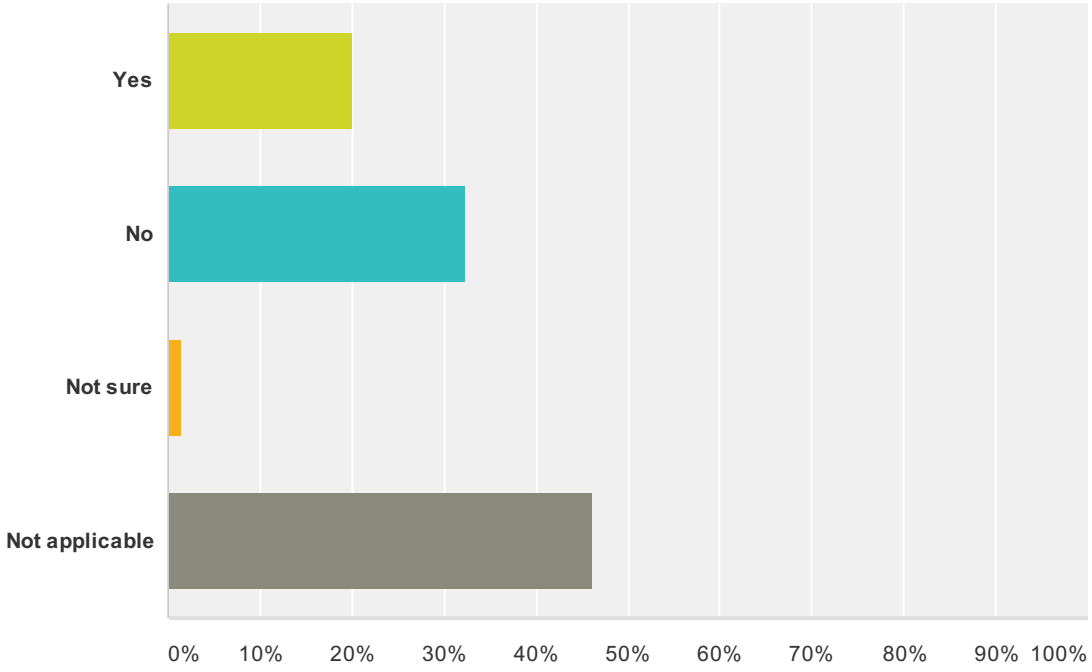
Answered: 65 Skipped: 2



Answer Choices	Responses	
Yes	**16.92%**	11
No	**27.69%**	18
Not sure	**3.08%**	2
Not applicable	**52.31%**	34
Total		**65**

Q13 After hearing about the PV Value® tool, did you give it to an appraiser when they were appraising your home?

Answered: 65 Skipped: 2



Answer Choices	Responses	
Yes	**20.00%**	13
No	**32.31%**	21
Not sure	**1.54%**	1
Not applicable	**46.15%**	30
Total		**65**

Q14 If PV Value was used to value the PV system on your home, what was the size of your system in kilowatts, and what was the value of the PV system?

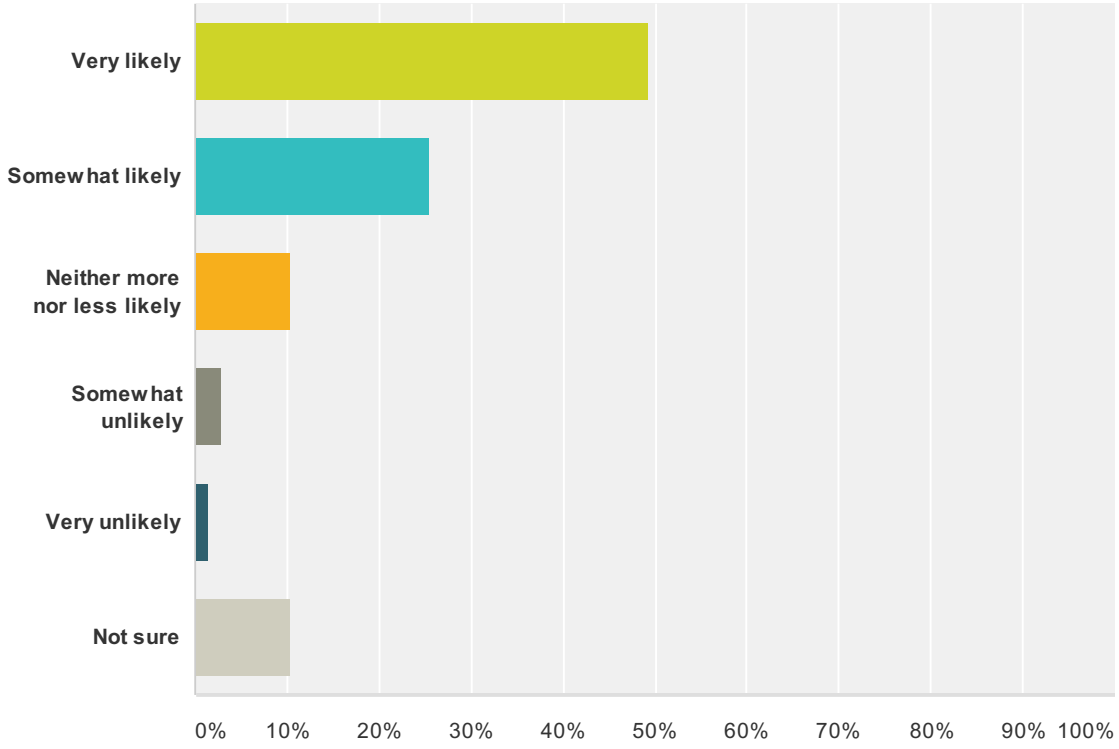
Answered: 33 Skipped: 34

#	Responses	Date
1	The system is 4.51kW & the appraiser refused to add any value to the appraisal.	5/15/2014 6:09 PM
2	10kW DC (8kW AC), $16-18 thousand	5/15/2014 9:34 AM
3	6.58 KW $20,495 (average)	5/14/2014 8:43 PM
4	13.7 kW, $50k	5/14/2014 2:59 PM
5	4.32,	5/14/2014 9:36 AM
6	4.2	5/14/2014 9:19 AM
7	17kWatts. I used your system a little differently. I was doing a cost-benefit to see the payback on the PV system. I ran different scenarios from a combination of vendors, sizes and potential sales dates in the future. I used the result to get a comfort level of the value it adds to my home.	5/14/2014 9:14 AM
8	5.22 kW unable to use the PV value tool	4/27/2014 10:21 PM
9	5.46 / $32,214.00	4/25/2014 7:04 PM
10	3 kW system that we paid $20K for less than a year before I used the tool (the appraiser valued it at $3500)	4/25/2014 11:52 AM
11	6 kWatt. ~$20,000.	4/25/2014 7:59 AM
12	9633watts and about 21,000 dollars	4/25/2014 4:46 AM
13	7.755kw	4/24/2014 8:32 PM
14	12,000 Added home value of approx$50,000	4/24/2014 7:49 PM
15	10 kW About $19K	4/24/2014 6:33 PM
16	Lost tool link Today produced 31.5 kwh/13.3 hrs daylight	4/24/2014 6:16 PM
17	25KW.	4/24/2014 5:47 PM
18	PV value was approx. $62K in 2010.	4/24/2014 5:32 PM
19	11.3 kw (battery back up just as an fyi) valued at 3 levels with you tool... low $20,479 Average $22,160.35 High $24,017.22	4/24/2014 5:00 PM
20	9.1kw... 18k	4/24/2014 4:57 PM
21	5 kw, I haven't use the tool to value my home.	4/21/2014 9:27 AM

22	7KW $18K	4/17/2014 12:42 AM
23	3,220 kWh @ 15 yr, average $4,337 @ 30 yr, average $4,054	4/13/2014 9:00 PM
24	2 kW, for which I paid <16000 $ in 2009, installed with Enphase micro-inverters	4/12/2014 8:46 PM
25	1.8KWH and $4,309	4/12/2014 11:53 AM
26	10.8 KW	4/11/2014 10:34 AM
27	3.5	4/11/2014 5:35 AM
28	Have signned preliminary documents for an install within 6 weeks.System size is6.867 kw.	4/10/2014 6:41 PM
29	5.06 KW DC. Agent couldn't figure how to use the tool and neither could I.	4/10/2014 1:26 PM
30	8kw, $25k	4/10/2014 12:52 PM
31	don't remember	4/10/2014 12:25 PM
32	N/a	4/10/2014 12:19 PM
33	4.6 16,000	4/10/2014 12:15 PM

Q15 How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?

Answered: 67 Skipped: 0



Answer Choices	Responses	
Very likely	**49.25%**	33
Somewhat likely	**25.37%**	17
Neither more nor less likely	**10.45%**	7
Somewhat unlikely	**2.99%**	2
Very unlikely	**1.49%**	1
Not sure	**10.45%**	7

Total	**67**

Q16 What would make the PV Value tool more useful?

Answered: 37 Skipped: 30

#	Responses	Date
1	Finding a way to make it a standard part of the real estate listing, a requirement for appraisers to consider, and better understood by buyers and their agents. We are finding that buyers are not taking our PV system value into account. It is being entirely discounted in the sales price of the home.	5/14/2014 8:43 PM
2	Including an option to include RECs within the tool or other incentives.	5/14/2014 2:59 PM
3	Have not used todate so no point of reference	5/14/2014 10:41 AM
4	Port a Mac version (although web would work fine)	5/14/2014 9:42 AM
5	If appraisers would consider it. But they don't.	5/14/2014 9:19 AM
6	The web version! :)	5/14/2014 9:16 AM
7	1. Add a cleaner data entry screen. 2. Perhaps help novice users to find the technical information the model requires. 3. Add a geographic component as the value of solar changes with location.	5/14/2014 9:14 AM
8	The PV value tool was too complicated for the real estate agent, and I couldn't help because I don't have a current version of MS Excel. A web based tool or something compatible with OpenOffice.org could be more useful. But thanks anyway - I appreciate your efforts!	4/27/2014 10:21 PM
9	Make it compatible with non "cutting edge" software and operating systems.	4/27/2014 7:01 PM
10	Simplify	4/25/2014 7:04 PM
11	Educate home appraisers on how to use it, and encourage them to.	4/25/2014 11:52 AM
12	I would make the variable input interface simpler (i.e., each variable input on one row, listed in vertical order) on one page (like this survey).	4/25/2014 7:59 AM
13	Further penetration into the appraiser community so there is a familiarity and confidence in its use	4/25/2014 4:46 AM
14	more appraisers use it	4/24/2014 8:32 PM
15	Haven't used it enough to determine how to improve it.	4/24/2014 7:57 PM
16	Support for multiple mount planes. Support for Feed-in Tariff value calculations. Support for system expansions at a later date (some years after the system was first installed).	4/24/2014 6:33 PM
17	Need tool link	4/24/2014 6:16 PM
18	Make it easier to understand the input parameters.	4/24/2014 5:47 PM
19	A state law that requires appraisers to use such a tool when appraising a home with solar!	4/24/2014 5:32 PM
20	A realtime power production monitoring tool	4/24/2014 5:14 PM

21	More options for system configurations	4/24/2014 5:05 PM
22	I tried to use the tool today actually and the mortgage rate would not say current even with today's date showing????? Other than that I find it user friendly.	4/24/2014 5:00 PM
23	Still learning to use it	4/21/2014 9:27 AM
24	Since I am not purchasing the system, and I already own my home, the discount rate is not applicable?	4/13/2014 9:00 PM
25	1. Include Minimum Monthly Payments (presently 20.50 $/month) 2. Explain the appraisal value more. Is it the added value of the home? If so, the home buyer, if paying for that extra amount, would be paying for the high cost of HELCO (in Hawaii County) electricity, which a PV system is to avoid. 3. Explain "Basis Points" 4. Include estimated oversize of PV in relation to annual kWh consumption. My PV is oversized by about 25% (no regrets) 5. Include consideration of on-site battery backup, to achieve uninterruptible power, minimize grid transmission losses (if operated in the max. self consumption mode).	4/12/2014 8:46 PM
26	I'm eager to have the tool move to being web-based. I am a Linux user and at present, I cannot access the tool since it's based on Microsoft Excel.	4/12/2014 7:38 PM
27	Make it easier to correct the formulas; e.g. the values did not compute at all due to an error with the base bond interest rates being out of date and they could not be updated.	4/12/2014 11:53 AM
28	Market acceptance by Appraisers and Realtors	4/11/2014 10:34 AM
29	a more simplified system for idiot real estate agents and appraisers.	4/11/2014 5:35 AM
30	Not sure if this was used by my contractor or not.([redacted])	4/10/2014 6:41 PM
31	MUCH fewer nebulous questions. I can't imagine why they were necessary. It was impossible to use the version we saw and we never got an answer --- yet and that was a year ago. I would still like to know the answer.	4/10/2014 1:26 PM
32	I think the web based version will be very beneficial. That will be a great change.	4/10/2014 12:52 PM
33	This tool helped us make a buy decision for our home in NH. it also helped us make a no-buy decision for the home in MA. Good tool.	4/10/2014 12:45 PM
34	To have it adopted and used in all home sales and appraisals.	4/10/2014 12:36 PM
35	increased awareness and training for builders, realtors and appraisers	4/10/2014 12:25 PM
36	Better knowledge!	4/10/2014 12:19 PM
37	it's recognition and acceptance in the appraisal community	4/10/2014 12:15 PM

APPENDIX B: SURVEY QUESTION MATRIX

Residential Appraisers		In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	How many times have you used the Photovoltaic (PV) Value® tool for a job assignment in the past year?	How easy was it to obtain PV system information from the homeowners?	Did you make adjustments upward or downward from the range of values provided by the tool?	If PV system information was not available, were you still able to make an estimate using PV Value®?	In addition to using PV Value®, did you use the cost approach or sales comparison approach when developing a value conclusion?	In your market, do you believe there are enough comparable properties with existing PV systems to use a comparable sales approach?	When you find comparable properties with PV, how do you use paired sales to develop the value?	If using paired sales, where did you find the information about comparable PV systems, in terms of size, age, condition, etc.?	Did the loan underwriter accept the valuation when submitting an assignment where the PV system was valued using PV Value®?	If the valuation was not accepted, what reason(s) did the underwriter give?	How recently have you taken a course on appraising solar PV systems?	How likely would you be to take an online course in valuing PV systems if the course met state certification CE requirements?	How frequently does the MLS in your area provide details about the presence of PV systems?	How likely are you to continue to use the PV Value® tool when it moves to a web-based platform?	To what extent do you enter PV system characteristics on AI Form 820.04 - Residential Green and Energy Efficient Addendum?
Residential Appraisers (cont.)	89	If you do not always, or never, enter PV system characteristics on AI Form 820.04 - Residential Green Energy Efficient Addendum, please explain why not.	When you appraise properties with PV systems, how frequently are PV systems shaded, or structures present that could shade the systems at various times during the day?	How frequently have you encountered third-party owned (leased or Power Purchase Agreement) PV systems when appraising a property?	If you have encountered third-party owned (leased or Power Purchase Agreement) PV systems, did you assign a value to the system?	If "Yes," what methods did you use to assign a value to the PV system?	Would you consider a third-party owned (leased or Power Purchase Agreement) PV system in a comparable property analysis?	Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	How frequently have you used PV Value® to develop the value of renewable energy credits (RECs or SRECs) or production based incentives (PBIs)?	How frequently do you consider functional obsolescence when valuing a home with a PV system?	How beneficial would access to appraised values of PV systems in your market area be to your practice?	What would make the PV Value® tool more useful?				
Commercial Appraisers	49	In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	How many times have you used the Photovoltaic (PV) Value® tool for a job assignment in the past year?	Did you make adjustments upward or downward from the range of values provided by the tool?	How easy was it to obtain PV system information from the property owner?	If information was not available, were you still able to make an estimate using PV Value®?	In addition to using PV Value®, did you use the cost approach or sales comparison approach when developing a value conclusion?	How recently have you taken a course on appraising solar PV systems?	How likely would you be to take an online course in valuing PV systems if the course met state certification CE requirements?	What basis point spread are you using (or would you use) to handle risk?	What is the source of your "risk free" rate?	Have you used any other tools for valuing a PV system?	If you have used a different tool for valuing a PV system, what was its name?	How likely are you to continue to use the PV Value® tool when it moves to a web-based platform?	How frequently have you used PV Value® to develop the value of renewable energy credits (RECs or SRECs) or production based incentives (PBIs)?	How beneficial would access to appraised values of PV systems in your market area be to your practice?	What would make the PV Value® tool more useful?
Real Estate Agent	10	In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Please explain your overall interest in the Photovoltaic (PV) Value® tool.	Have you listed any homes with solar PV systems in the last 5 years?	If "Yes," how many homes with solar PV have you listed in the last 5 years?	Did the home with solar PV sell more quickly than a home without solar PV?	Have you suggested the PV Value® tool to homeowners if they were not previously aware of it?	Have you used the PV Value® tool to develop a value as part of a "market analysis" for a homeowner?	Does the local MLS in your area provide data entry fields for PV systems?	When listing the property, what MLS fields did you use to enter the PV system details?	Are you aware of AI Form 820.04 - Residential Green and Energy Efficient Addendum?	If "Yes," was this form helpful when capturing the property details for a PV system?	Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	How beneficial would access to appraised values of PV systems in your market area be to your practice?	If you have used the PV Value® tool, what would make it more useful?
Lenders & Loan Officer	6	In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Please explain your overall interest in the Photovoltaic (PV) Value® tool.	Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	What challenges do you encounter that make it difficult to understand the value added by a PV system?	Do you believe PV systems add risk to the loan when included in value of the property?	If "Yes," describe the risk added and how that may be remediated.	Are you aware of any Fannie Mae, Freddie Mac, HUD, VA restrictions on recognizing the value of a PV system?	If "Yes," what specifically are those restrictions you've encountered?	How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	What would make the PV Value® tool more useful?					
Underwriter	1	In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Please explain your overall interest in the Photovoltaic (PV) Value® tool.	Have you used the PV Value® tool to check or validate an appraiser's valuation of a solar PV system?	Did you review the PV entry fields in AI Form 820.04 - Residential Green and Energy Efficient Addendum, in conjunction with the valuation?	What are the most important factors pertaining to the PV system that should always be included in the appraisal?	If you have reviewed an appraisal with a solar PV system, did you accept the appraiser's opinion of value?	If "Yes," did the appraiser use PV Value® exclusively, or a combination of other valuation approaches?	If "No" to Q5, was this due to Fannie Mae guidelines, Freddie Mac guidelines, HUD, VA or other?	If "No" to Q5, please provide more detail on what the appraiser did when you sent it back to them.	Have you encountered a valuation made by an appraiser for a third-party owned PV system?	If "Yes," did you accept, reject, or adjust the valuation?	Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	What would make the PV Value tool more useful?	
Government Users	18	In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Please explain your overall interest in the Photovoltaic (PV) Value® tool.	Have you used the PV Value® tool for appraisal or assessment purposes?	If "Other," please explain how you have used PV Value®.	Generally, do owned PV systems add to or reduce the value of real property in real estate transactions?	Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	If you are an assessor, do you use PV Value® (income approach), cost approach, sales comparison, or a combination of the three?	If you are an assessor, do you find the value determined using PV Value® to be greater or less than using the cost approach?	If your municipality exempts PV systems from assessments, do you still track the added value?	How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	How beneficial would access to appraised values of PV systems be for your work?	What would make the PV Value® tool more useful?				
Solar Industry Professionals	80	In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Please explain your overall interest in the Photovoltaic (PV) Value® tool.	Have you used PV Value® to help sell a PV system, or sell a lease / PPA for a PV system?	If you have used the PV Value® tool to sell a PV system or a lease/PPA, what impact did the value have on closing the sale?	Are you a third-party solar PV provider?	Generally, do owned PV systems add to or reduce the value of property in real estate transactions?	Generally, do third-party owned PV systems add to or reduce the value of real property in real estate transactions?	How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	If you are a third-party solar PV provider, has this tool been used by an independent appraiser to evaluate the potential fair market value of a PV system undergoing an ownership transfer?	Do you believe quality impacts the "market value" or "fair market value" of a PV system?	How beneficial would access to appraised values of PV systems be to your business?	What would make the PV Value® tool more useful?				
Homeowners	67	In what ZIP code are you located? (enter 5-digit ZIP code; for example, 00544 or 94305)	Please explain your overall interest in the Photovoltaic (PV) Value tool.	Do you currently own a solar PV system?	If "Yes," is it an owned PV system or a leased PV system?	If "No," are you planning on leasing or purchasing a PV system in the future?	If you own a PV system, did you pay cash or finance the PV system (independent lender, cash-out refinance, PACE assessment)?	If you have leased your PV system, do you have a monthly lease, pre-paid lease, or Power Purchase Agreement (PPA)?	If you own your PV system, do you believe your PV system adds value to your home?	If you have leased your PV system, do you believe your PV system adds value to your home?	If your leased PV system has an early buyout clause, do you plan to use it?	If you plan to, or have already exercised an early buyout option, do you believe the PV system adds more value during the lease period or after it is purchased?	After hearing about the PV Value® tool, did you give it to a real estate agent to develop a 'market analysis' before listing your home for sale?	After hearing about the PV Value® tool, did you give it to an appraiser when they were appraising your home?	If PV Value was used to value the PV system on your home, what was the size of your system in kilowatts, and what was the value of the PV system?	How likely are you to use (or continue to use) the PV Value® tool when it moves to a web-based platform?	What would make the PV Value tool more useful?

List of questions for each self-identified user, followed by number of survey participants. Color groups highlight identical or similar questions across user classes.

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